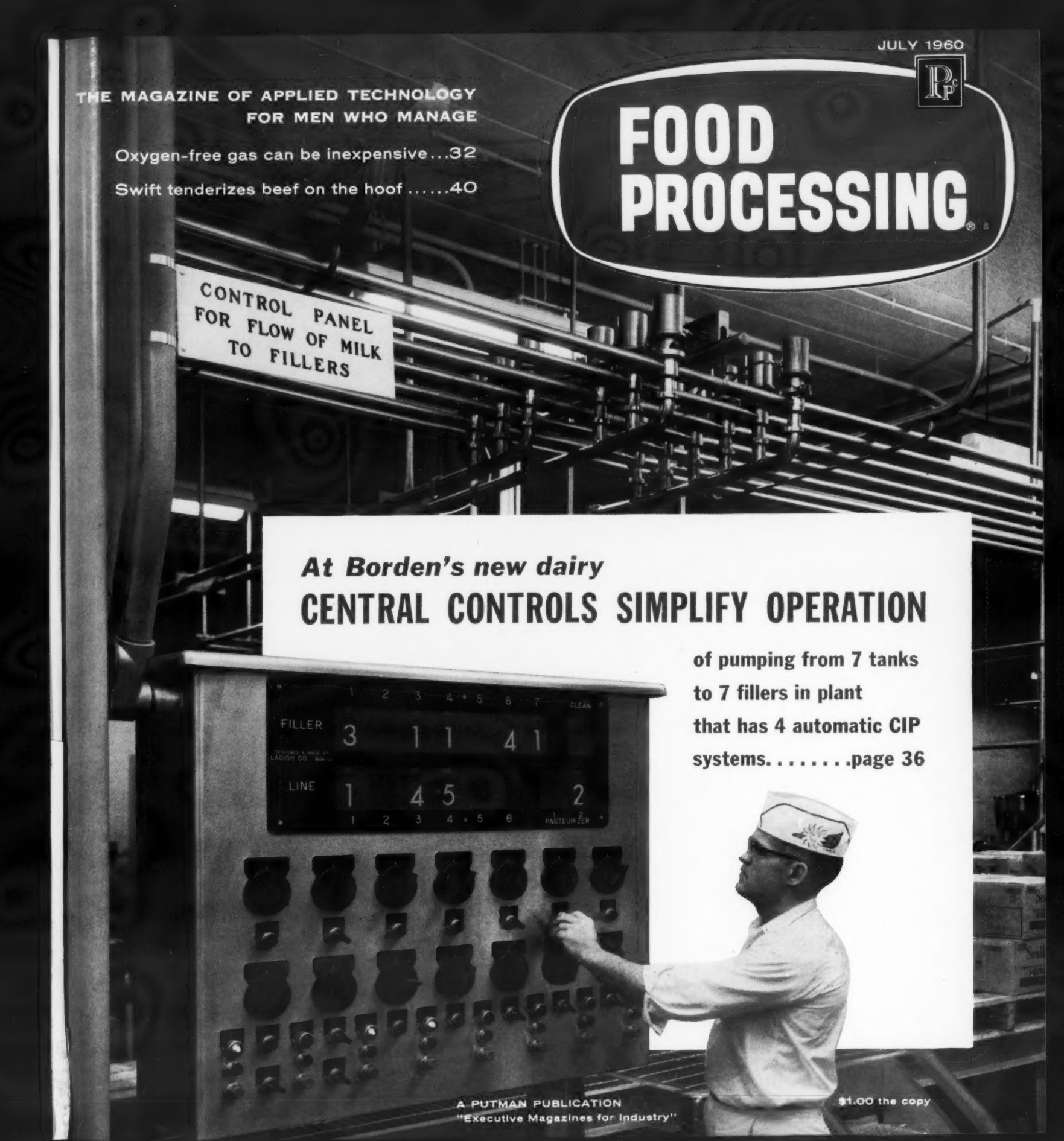
JULY 1960

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

Oxygen-free gas can be inexpensive...32

Swift tenderizes beef on the hoof 40

FOOD PROCESSING®



At Borden's new dairy

CENTRAL CONTROLS SIMPLIFY OPERATION

of pumping from 7 tanks to 7 fillers in plant that has 4 automatic CIP systems. . . . . .page 36

A PUTMAN PUBLICATION
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MODERN DAIRY INGREDIENT GIVES APPETITE APPEAL TO A VARIETY OF FOOD PRODUCTS

Valley Fresh Sweet Dairy Whey, an excitingly different dairy ingredient, contributes to the taste, texture, shelf life and finished color of almost every known food product. And as others have found out...formula costs decrease.

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Appleton, Wisconsin

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Don't bug me, boy!

"Development of vegetable varieties with insect resistance has not been given the attention that some of our field crops have received," points out Dr. Marion W. Parker, director of the Crops Research Division of the USDA's Agricultural Research Service.

He acknowledged that the effectiveness and economic feasibility of modern pesticides has perhaps been responsible for this situation. "However," he stated, "in view of the repeated and rapid rise of insecticide-resistant insects . . . much more attention needs to be given to the development of built-in insect resistance."

For more information on product at left, circle 7692 see information request blank opposite last page.

that's interesting

Cranberries' sour note is cherries' jubilee

During the past Thanksgiving-Christmas holiday season — with an unexpected assist from HEW Secretary Flemming's press conference— cherries blossomed as a saucy rival of cranberries.

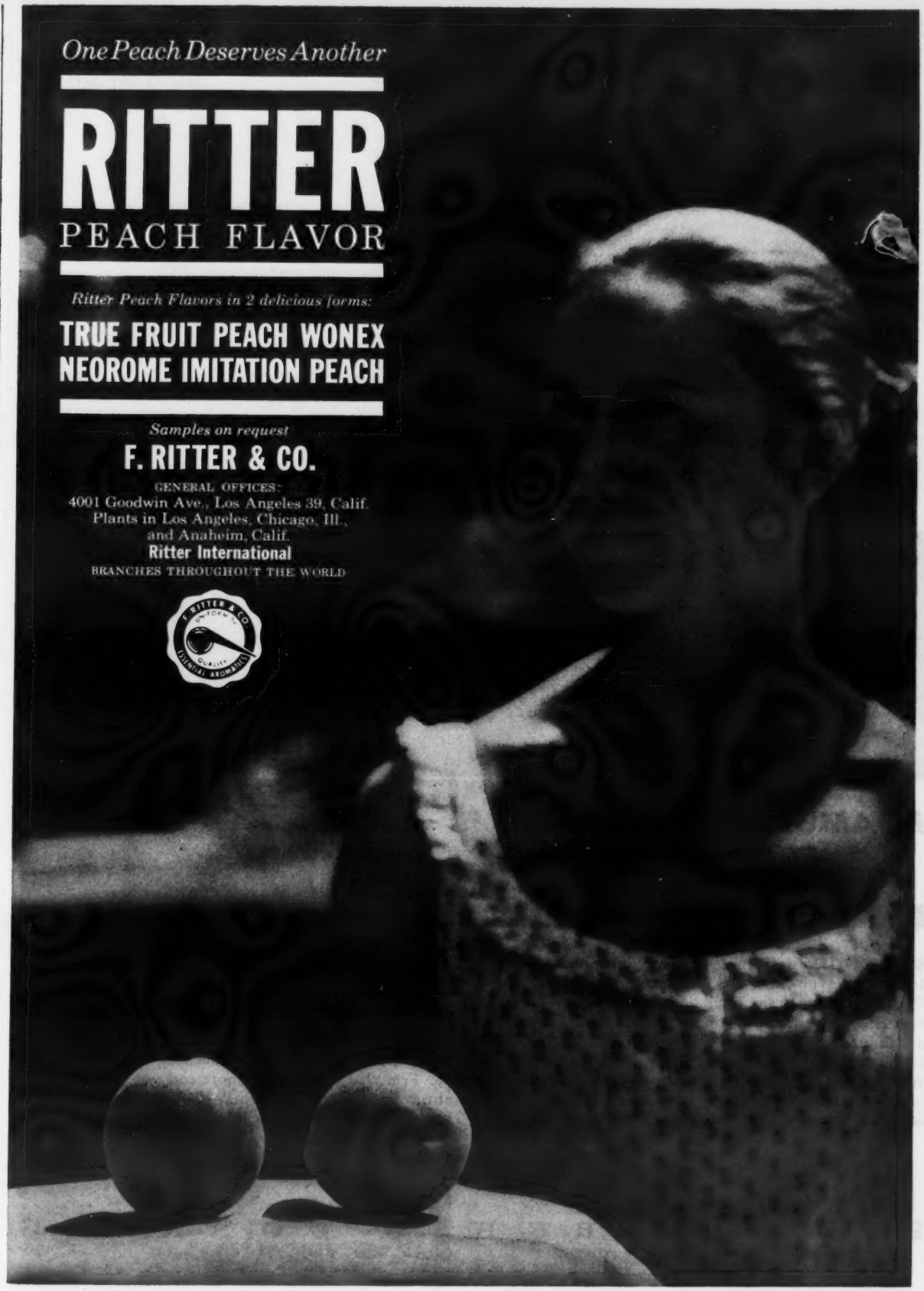
Quick to capitalize on the cranberry ferment, alert cherry packers found the situation

ripe to promote both frozen cherry sauce and a new cherry juice. Frozen cherry prospects may become even hotter as intensified national advertising talks cold turkey to the housewife on uses for frozen cherry sauce.

Onions and automation

While Americans are consuming more onions than ever — 2½ billion lb, or 14.29 lb per capita in 1959 — the raw onion itself is vanishing. Few processors use raw onions in their products, and, in the home, the housewife is fairly emancipated from peeling, coring, slicing, chopping and mincing.

Behind it all, according to Dr. Arthur N. Prater, president of Gentry, a Div. of Consolidated Foods, are expansion of facilities of America's onion dehydration industry, centered in California, and development of such improved processing methods as dehydration of onion pieces by the so-called tunnel-drying method.



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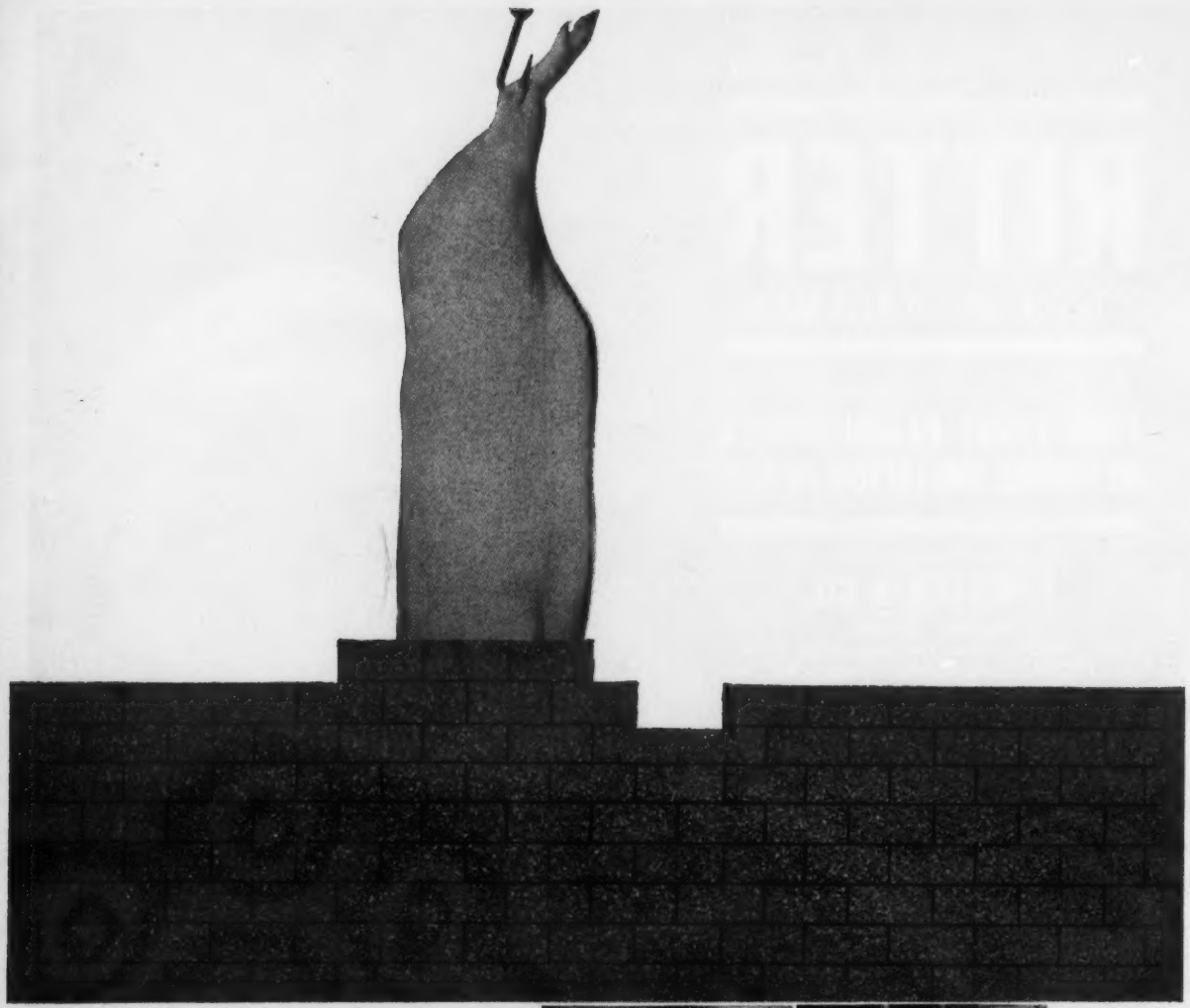

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New installations for Eckrich have just recently been completed . . . all insulated with FOAMGLAS.

For the full story on this installation, write for a copy of our Eckrich Case Study Report and our Low Temperature Insulation Catalog. Pittsburgh Corning Corp., Dept. FP-70, One Gateway Center, Pittsburgh 22, Pa.

Pittsburgh Corning makes available a complete line of insulation accessories for use with FOAMGLAS.

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over the editor's shoulder

Are you up to date on CIP developments?

Tremendous possibilities for simple, more effective processing appeared two years ago. At that time remote-controlled sanitary valves became practical.

FOOD PROCESSING has been keeping you informed not only of indirect improvements in such systems but also on their use.

In April 1959, we presented a first-hand report on how various engineering difficulties were overcome in adapting these valves to an automatic CIP system at Grocer's Dairy Company.

Last month we explained in detail the application of timer and other components to an automated system at Baker Laboratories, Inc.

This month, the latest refinements, such as pulsating valves, are discussed in an article on Borden's new plant. This article begins on page 32.

One advantage of automated CIP systems that deserves more emphasis is the elevation of skill required by cleaning labor. Obviously more consistent and better cleaning and sanitizing results when it is in the hands of technicians.

For detailed description of other advantages, you are referred to these articles.

Frank L. Bonney

ASSOCIATE EDITOR

THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE

JULY 1960
VOL. 21 NO. 7

FOOD PROCESSING

CIRCULATION OVER 39,000

Highlights

29 Industry Unites to Achieve Better Frozen Food Handling

AFDOUS postpones action on adoption of zero code for a year

32 Oxygen-Free Gas is Inexpensive

Generated on premises, at rate of only 550 cfh, oxygen-free gas costs less than four cents per 100 cubic feet — Howard P. Milleville, Editor

36 Plant Features Automatic Process Flow, Automatic CIP

Borden's new Milwaukee dairy automatically handles flow of over six fluid products through two remote-control panels and also features four automatic CIP systems — Frank Bonem, Associate Editor

40 Swift Tenderizes Beef On The Hoof

Foreshadows changes in the meat industry — Joe Voorhees, Associate Editor

47 Eliminate Pasty Quality of Many Starch-Based Foods

Exploratory research indicates successful results with macaroni, spaghetti, noodles, cooked cereals and gravies for prepared foods

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FOOD PROCESSING

(Food Processing Preview)

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Write for Catalog No. 55 describing this and other WEIGH RIGHT low-cost, better-performing tools of packaging.

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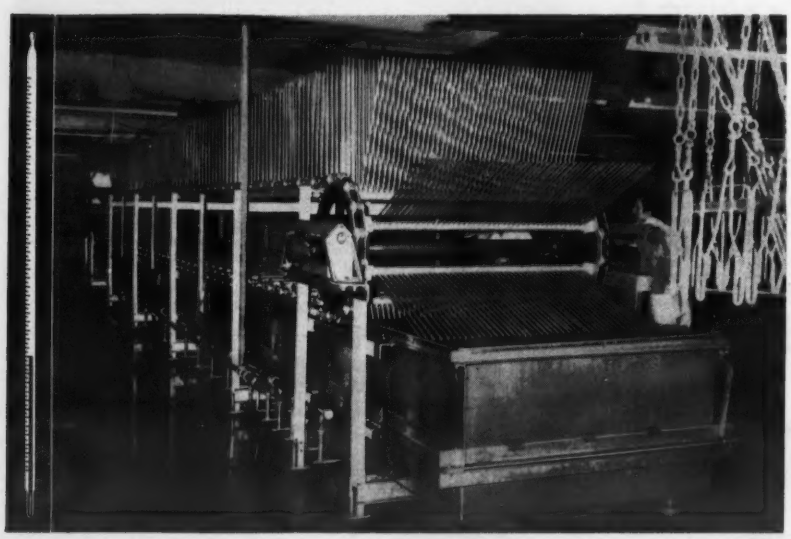
The Frick Company, pioneers in refrigeration, has developed an economical process that is years ahead of other methods of chilling freshly killed birds. Using a continuous flow of cold water instead of costly ice, the Frick system cools the birds to 36 or 37 degrees—not just the minimum requirement of 40—thereby preserving freshness and locking in flavor.

Frick's ability to design and install quality refrigeration for processing, packaging and storing foods of *all* types is recognized by engineers throughout the world.

No matter what *your* refrigeration or air conditioning problem is . . . for beans or beer, poultry or peaches, pharmaceuticals or farm-fresh apples . . . Frick offers depend*ability*.

If your business requires refrigeration or air conditioning in *any* phase of its operation, a Frick engineer will be happy to discuss it with you at no obligation.

FRICK COMPANY, Waynesboro, Pennsylvania



• Here's a Frick Counter-Flow-Continuous ("C-F-C") Poultry Chiller, one of four in operation at Holly Farms Poultry Processing Plant, Wilkesboro, North Carolina.

The continuous flow of water passes through only once, with no recirculation, and the chiller operates continuously instead of in batches.

Savings up to ¼c per pound are realized by using the Frick "C-F-C" chiller when compared to the use of ice. Figure the money saved at Holly Farms, which processes 9,600 birds an hour, using Frick refrigeration equipment exclusively.

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PRODUCTS AND PACKAGES

New 'twist' . . .

. . . instant soft-drink mix with vitamin C added is being introduced in the New York, Syracuse and Denver markets by Perkins Division of General Foods Corp. Flavors are orange, lemon, grape and cherry, available in seven-oz and 14-oz jars.

Saran-wax 'sandwich' . . .

. . . protects 13¼-oz blocks of Gail Borden Signature Quality cheddar cheese in medium sharp, sharp and extra sharp varieties. Consisting of two layers of Dow's Saran Wrap, with a coating of wax between, the packaging allows easy slicing without removing wrapper, which continues to provide complete product protection.

Supplier: Printon Corp., 308 E. 23rd St., New York, N.Y. 7700 on Reader Service Slip.

Making paper work . . .

. . . as packaging material for a variety of hygroscopic food products is one of newest applications for Du Pont's "K" cellophane. "K"-cellophane-lined paper bags used by The Pillsbury Company for full line of institutional flour mixes reportedly have reduced bag cost, increased shelf life, shown good stability in cold weather and adequate water vapor and grease resistance.

Cool for cookouts . . .

. . . two-qt foil-paperboard laminated cold pack keeps Piel Brothers beer cold for several hours at beach, during cookouts, picnics. Package's advantages stem from aluminum foil's excellent insulation qualities and its ability to reflect outside radiant heat.

Supplier: Reynolds Metals Company, Richmond 18, Va.

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Crisp and colorful . . .

. . . photo images now can be precision-printed on corrugated containers at high speed — opening new merchandising possibilties for this packaging medium. New "Fiber-Mate" synthetic rubber photographic plate, developed and patented by James J. Matthews Co., Pittsburgh, permits almost 100 per cent release of printing inks — allowing reduced ink volume in producing precise reproductions at high speed. First broad application of process is development of entire new family of packages for Wilson Sporting Goods Company to help introduce its new "famous player" sports gift packs.

Supplier: Packaging Corporation of America, 1632 Chicago Ave., Evanston, Ill.

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Transparent temptation . . .

. . . to buy is crystal-clear reason for outstanding expansion into glass packaging of several instant food products. Among examples cited by Owens-Illinois, 14th & Adams Sts., Toledo 1, Ohio, are mushrooms, today packed in glass by approximately nine packers (upper photo) vs only one in mid-1958. As for instant minced onion (lower photo) a survey conducted in five metropolitan centers showed that 85 per cent of housewives preferred glass as the container. Main reasons are that they can see the contents and how much is left, and are able to reseal tightly.

Save up to ⅓ on the cost of your next conveyor...new handbook shows how

Tells how to cut planning and installation costs with pre-engineered, ready-built conveyor components for immediate or future handling needs

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conventions and exhibits

July 25-27. American Oil Chemists' Society, 1960 short course on edible fats, Garner Hall, University of Illinois, Urbana.

Aug. 8-12. Gordon Research Conferences, Food and Nutrition, Colby Junior College, New London, N.H.

Sept. 1-7. International Union of Nutritional Sciences, Fifth International Congress on Nutrition, Sheraton-Park and Shoreham hotels, Washington, D.C.

Sept. 11-16. American Chemical Society, 138th national meeting, New York, N.Y.

Sept. 20-21. Research and Development Associates, Military-Industry Conference on freeze drying and other dehydration methods of food preservation, Stock Yard Inn, Chicago.

Oct. 17-21. National Safety Council, 48th annual National Safety Congress, Conrad Hilton, Pick-Congress, Sheraton Towers, Morrison and LaSalle hotels, Chicago.

Oct. 24-27. Institute of Sanitation Management, Annual Sanitation Maintenance Conference & Show, Sheraton-Cadillac Hotel, Detroit, Michigan.

Oct. 26-29. International Assn. of Milk and Food Sanitarians, annual meeting, Hotel Morrison, Chicago.

Oct. 31-*Nov.* 5. Dairy Industries Supply Assn., 22nd Dairy Industries Exposition, International Amphitheatre, Chicago.

Nov. 1-3. The Material Handling Institute's Central States Show, Kentucky Fair and Exposition Center, Louisville, Ky.

Nov. 14-17. American Bottlers of Carbonated Beverages, 42nd convention and concurrent 1960 International Soft Drink Exposition, Cobo Hall, Detroit.

SARCO TOPICS

How to get dry steam, automatic temperature control, and rapid heat-up in processing food

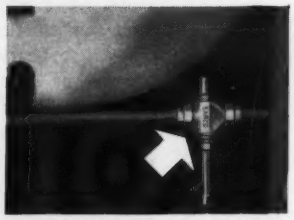
How to dry out steam in conditioning grain

Gwinn's solution: Sarco Thermo Dynamic Steam Trap on grain conditioning unit.

Slugs of condensate and wet steam need not disturb the processing of grain. This problem may be caused by manual operation of valves, which makes it difficult to control the steam's moisture content. It was solved at Gwinn Bros. & Co., Huntington, W. Va., with a system of traps and valves which featured a Sarco Thermo-Dynamic steam trap, Type TD-50. Moisture control is now fully automatic, product is more uniform, and the operator is now free to perform more useful work.

How to control jacketed kettle temperature automatically and economically

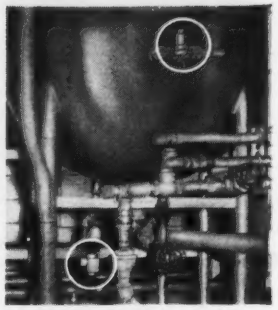
Manual temperature control of steam jacketed kettles is uncertain and frustrating. Install self-powered automatic Sarco temperature controls which are inexpensive, simple, dependable, accurate and save steam. They are easy to install on any equipment, without complicated gadgets that require specialized maintenance. Self-contained, with no exposed mechanism, they are not affected by cross-ambient temperature or bulb elevation.



Sarco self-powered temperature control also cuts down steam waste on kettles.

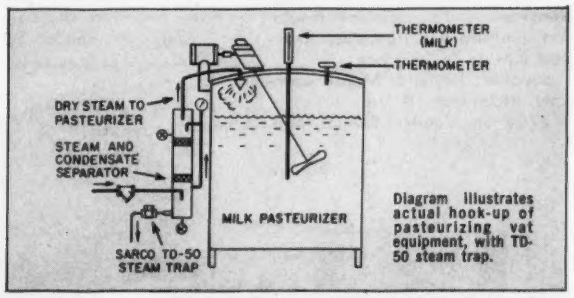
Get rapid heat-up, maintain cooking schedules —with proper steam trapping.

When cooking schedules aren't being met, and parts of the steam jacket fail to heat, examine your trapping system. Investigation usually shows condensate and air are not being adequately discharged. The problem was solved at F. and F. Laboratories, Chicago, Ill., by equipping each kettle with a ¾" Sarco TD-50 Steam Trap, installed close to the condensate outlet. In addition, the jacket of each kettle was vented by a ⅜" Sarco Thermostatic Air Vent. Now not only is heat-up rapid, but operating cycle is on schedule, and the TD-50's haven't even required cleaning in three years of operation.



Complicated connections and check valves are eliminated on F. & F.'s Kettle. Note simple piping of steam trap and vent.

Rapid discharge of condensate guarantees dry steam for special pasteurizing problem


THERMOMETER (MILK)
THERMOMETER
DRY STEAM TO PASTEURIZER
STEAM AND CONDENSATE SEPARATOR
MILK PASTEURIZER
SARCO TD-50 STEAM TRAP
Diagram illustrates actual hook-up of pasteurizing vat equipment, with TD-50 steam trap.

Michigan State law requires that air and foam in the space between milk level and pasteurizer vat cover be heated to at least the temperature of the milk during processing. Fogg's Dairy Sales in Holland, Mich., used dry steam at 100 psi for the purpose but had a problem in eliminating condensate prior to introducing the steam into the air space. Installation of a Sarco TD-50 Steam Trap and strainer at the bottom of the control chamber completely cleared up the difficulty by discharging condensate as rapidly as it formed. Mr. Fogg says: "Most reliable and trouble-free trap we've ever used. Body is compact and easily cleaned, important where scrupulous cleanliness is essential."

★ ★ ★ 2961

For practical information and technical data on steam trapping and temperature control, contact your Sarco sales representative or district office, or write:

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1. *Simplicity*—has only one moving part. 2. *Maintenance*—practically zero. 3. *Wide pressure range*—one trap for all pressures from 10 to 600 psi. 4. *Uniform performance*—operates equally well on heavy, light, or no condensate load. 5. *Operates against back pressures*—up to 50% of inlet pressure. 6. *Rugged*—unaffected by superheat, water hammer, vibration, or corrosive condensate. 7. *Minimizes inventory* of spare parts.

Maintenance Time: 40 Seconds. If it now takes your maintenance crew more than a couple of minutes to service an ordinary trap, you're throwing away valuable time. This Sarco Thermo-Dynamic can be cleaned, blown out if necessary, and reassembled on the line in as little as 40 seconds.

For Prompt Information on the TD-50 . . . or for fast help on the efficient solution of any steam trapping problems, get in touch with a SARCO District Office, Sales Representative, or Distributor. (There's one near you.)

Only SARCO makes all 5 types:
Thermo-Dynamic* • Thermostatic • Liquid Expansion • Float Thermostatic • Inverted Bucket

*U.S. Pat. No. 2,817,353 TM Reg. U.S. Pat. Off. 1409

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635 MADISON AVENUE, NEW YORK 22, N. Y.
PLANT: BETHLEHEM, PA.

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food regulations

Chronic package shortweight revealed in FDA survey

More rigorous enforcement of laws on way

Food processors with a product weight responsibility, either actual or implied, will be interested in an FDA conducted survey which reveals that the consumer is getting a "trivial" but chronic shortweight.

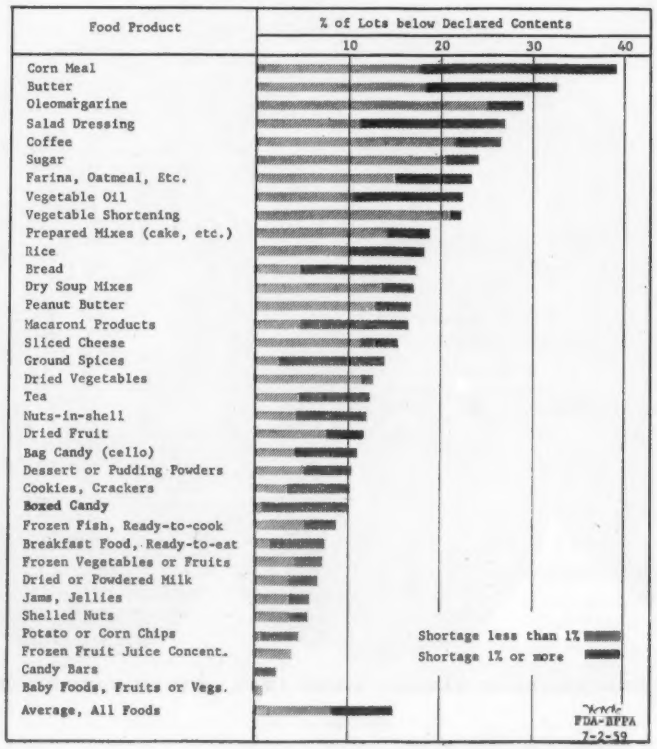
The survey results were disclosed by Chester T. Hubble of the FDA's enforcement bureau. He addressed the 45th National Conference on Weights and Measures in Washington, D.C.

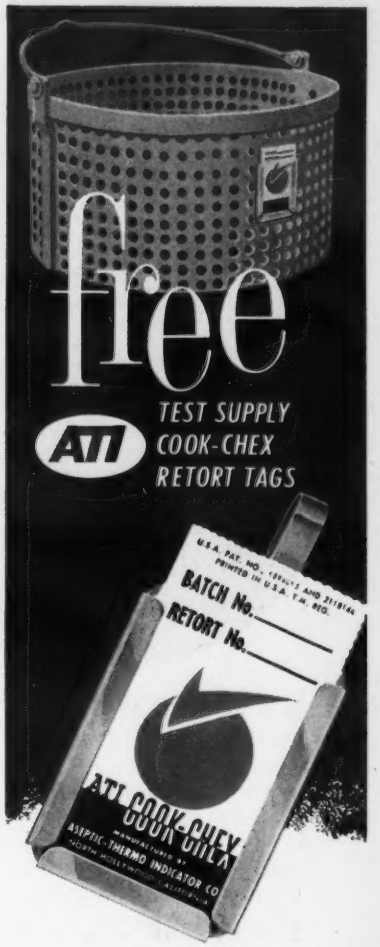
The survey was based on a random sampling of nearly 107,000 packages of 35 commodities including cornmeal, butter, coffee, rice, salad dressing and other basic products.

The survey, which allowed overages cancelling out shortages, revealed that in coffee, for instance, at 75 cents a pound the consumer was shortweighted about 7/10's of a cent a pound in about 40 per cent of the cases. Nothing in itself; but overall on canned coffee it could mean up to $5 million per year.

While he didn't issue a general condemnation, Mr. Hubble did point out that relatively low fines encouraged marginal or unscrupulous operators. He noted that three firms producing macaroni were criminally prosecuted on shortages ranging up to 17 per cent with an average shortage of 5 per cent. They drew fines of only 600 to 1000 dollars.

Inquiry by FOOD PROCESSING indicates closer supervision and more rigorous enforcement by FDA investigators.





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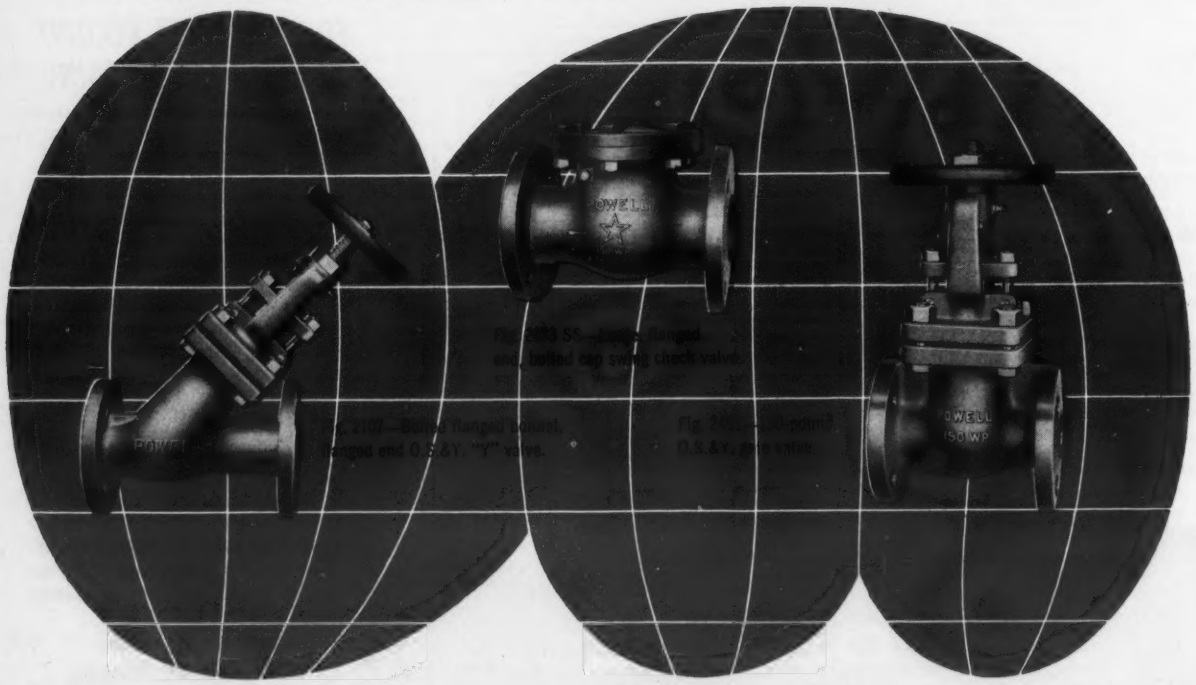

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Delaney clause part of House color bill

A tolerance-setting color additives bill has been reported by the Interstate and Foreign Commerce Committee to the House of Representatives. The committee bill, H.R. 7624, is based substantially on one originally drafted by HEW.

Over strong industry objections and disagreement within the committee itself, the bill as reported contains the controversial Delaney clause.

This clause, also part of the Food Additives Amendment of 1958, provides that a color additive shall not be listed if it is found to induce cancer when ingested by man or animal, or by other tests considered "appropriate for the evaluation of the safety of additives . . . ."

In its report on the bill, the committee summed up its reasons for including the clause and concluded:

"In view of the uncertainty surrounding the determination of safe tolerances for carcinogens, the committee decided that the Delaney anticancer provision in the reported bill should be retained without change."

The committee, however, adopted an amendment for an ad hoc advisory committee to study and report on the question of whether a color additive is a carcinogen.

The committee amendment provides that in any proceeding for a regulation listing a color additive any person who will be adversely affected may request that the petition or order be referred to an advisory committee for a report and recommendation.

The advisory committee is to be composed of experts selected by the National Academy of Sciences, "qualified in the subject matter referred to the committee and of adequately diversified professional background."

Recommendations of such a committee would not be strictly binding on the HEW Secretary. They would be made part of the record, entitled to the same weight as other evidence presented at

the hearing.

In a letter to the House committee before reporting of the bill, USDA criticized the Delaney clause as "unnecessary," both in proposed color legislation and existing food additives legislation.

"The anticancer clauses," USDA says, "are flat prohibitions against the exercise of scientific and professional judgment in the determination of safety."

The letter goes on to say that the Secretary of HEW "has adequate authority to withhold from use any additive that he is unable to find would be safe in regard to cancer as well as in regard to toxicity and other factors."

Last session, the Senate passed a bill (S.2197) on color which had no Delaney clause.

If the House passes a color additives bill, it will then go to a House-Senate Conference Committee where any differences will have to be reconciled.

Court refuses to rule on additives before petition is filed with FDA

In the first court case under the Food Additives Amendment, FDA has won a decision which it considers "extremely important" to the orderly enforcement of the law.

Under the terms of the law, the FDA Commissioner upon written request will advise an interested person whether in his opinion a substance, adequately described, is a food additive.

Last August, the Los Angeles Smoking and Curing Company requested an opinion whether sodium nitrate and/or sodium nitrite are "food additives" when used in the smoking and curing of fish and fish products, where the use of such substance does not result in a residue of more than 200 parts per million of nitrites in the finished product.

The Commissioner responded, stating that in his opinion these substances are "food additives" when used in

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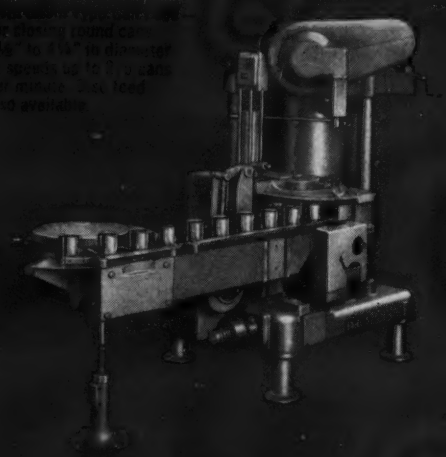

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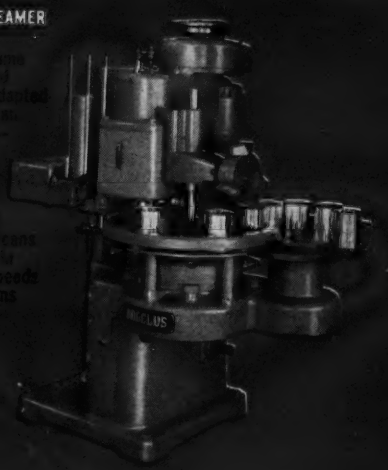
MODEL 60L SEAMER

MODEL 10P SEAMER



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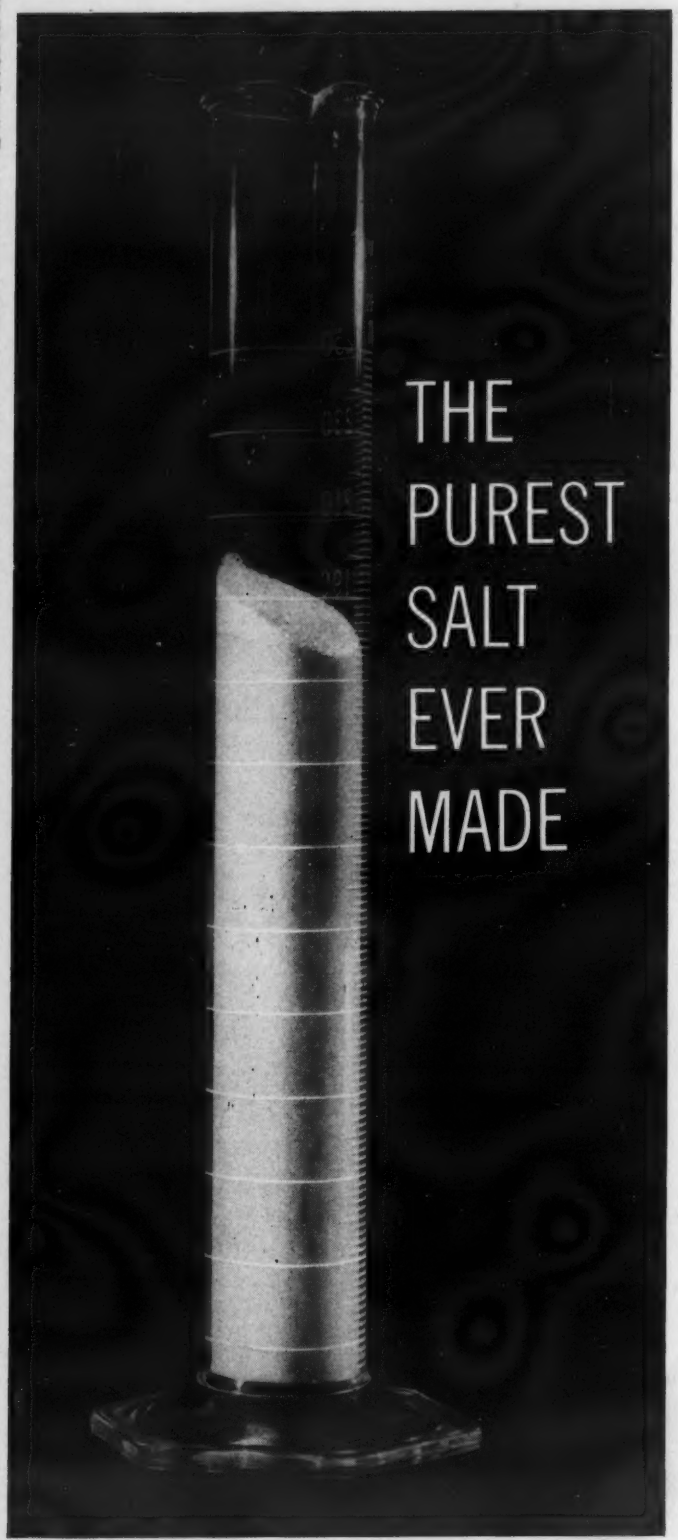

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INTERNATIONAL STERLING SALT SALT COMPANY

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the manner indicated and suggested that a petition for a tolerance be filed under the Food Additives Amendment.

The Los Angeles Smoking and Curing Co. then moved in the Federal court to obtain a ruling that sodium nitrate and/or sodium nitrite are generally recognized as safe when used in the curing and smoking of fish and fishery products in amounts not to exceed 200 parts per million in the finished product.

The Government opposed this action because FDA did not believe the court had jurisdiction since no real controversy in a legal sense existed. All that had occurred was that the Commissioner expressed an *advisory* opinion that the plaintiff's product was a food additive. The only regulatory action FDA had taken against fishery products involved articles with more that 200 parts per million of nitrites.

The court agreed that it did not have jurisdiction and therefore dismissed the action. The court did not decide the basic question of whether sodium nitrate and/or sodium nitrite are food additives when used in fish and fishery products in amounts not to exceed 200 parts per million.

This was a question to be settled within the administrative process, and the company retained the right to raise this question when it files a petition under the Food Additives Amendment. Thereafter the firm can obtain a court ruling on this point, if it does not agree with the Government's action on the petition.

The regulation, which provides that the Commissioner will advise an interested person whether in his opinion a substance is a food additive, could not be retained if every informal opinion could be the basis for a suit for declaratory judgment.

An FDA official points out that from industry's stand-

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FLO-SWEET INVERDEX ... for balanced body and sweetness

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Inverdex is just one of the new Flo-Sweet sugars developed to give you a *combination* of desirable characteristics never before available. For full information, just consult your Flo-Sweet Engineer or write for the brochure "New Ingredients for New and Improved Food Products." It tells all about four new Flo-Sweet liquid sugars!

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point the court decision means that companies can continue to obtain the informal *opinion* of the Commissioner on any question involving the Food Additives Amendment. From FDA's standpoint, it means the Commissioner can continue to offer his *opinion* on questions, without being subjected to suit and being forced to trial at a time when he might not be fully prepared to try the complex scientific factual issues which may be involved.

Final action is pending on a request by the firm for an extension of time for use of sodium nitrate and sodium nitrite in fish and fishery products in amounts not to exceed 200 parts per million.

FDA acts on 304 direct additives

Another generally-recognized-as-safe list has been published by FDA. This one, consisting of 82 spices, seasonings, essential oils and natural extractives, appears on page 52, this issue.

Time extensions have been granted on 212 flavoring substances and natural substances used in conjunction with flavors. List will be published next month.

Time extensions for ten other direct additives follow:

3,5-Diiodosalicylic acid
300 ppm in feed-grade salt for animal use.

Mannitol
If an amount of the food that may reasonably be consumed as an average serving contains 2.5 grams or more of mannitol, the label shall bear a statement of the number of grams of mannitol in an average serving of food. The average serving shall be expressed in terms of a convenient unit or units of such food or a convenient unit of measure that can be readily understood and utilized by purchasers of such food. The label shall also bear a statement that the consumption of more than 7.5 grams of mannitol at one time or more than 20 grams of mannitol per day may have laxative effects.

Methyl formate
In raisins and currants as a residue from use as a fumigant, applied at a rate of 0.77 milliliter per pound of fruit.

Sorbitol
If an amount of the food that may reasonably be consumed as an average serving contains 5 grams or more of sorbitol, the label shall bear a statement of the number of grams of sorbitol in an average serving of the food. The average serving shall be expressed in terms of a convenient unit or units of such food or a convenient unit of measure that can be readily understood and utilized by purchasers of such food. The label shall also bear a statement that the consumption of more than 15 grams of sorbitol at one time or more than 40 grams of sorbitol per day may have laxative effects.

Starch, oxidized, prepared by treating starch water suspension with sodium hypochlorite and hydrogen peroxide
As an ingredient and stabilizer in prepared foods

Bithionol and methiotriazamine mixture
500 ppm bithionol 100 ppm methiotriazamine in poultry feed as a coccidiostat. Discontinue feed 3 days before marketing the birds to allow for elimination of the drug from edible tissue.

Ethylene oxide
50 ppm in dehydrated or freeze-dried mushrooms as residue from use as fumigant. In edible gums, as a residue from use as a fumigant.

Lactic acid esters of mono- and diglycerides derived by glycerolysis of edible vegetable and animal fat.
As emulsifiers in foods in accordance with good manufacturing practice.

Piperonyl butoxide and pyrethrins mixture
30 ppm piperonyl butoxide; 3 ppm pyrethrins as residues in dried citrus pulp for animal feed from treating the stored pulp in burlap bags for insect control. Data demonstrates no residue in milk from feeding lactating dairy animals citrus pulp with these additives at or below the amounts listed.

Polyethylene glycols having molecular weights from 200 through 6,000
As components of coatings or binders for tableted foods, in accordance with good manufacturing practice.

FDA rejects biscuit makers definition of chocolate

Latest development in the chocolate-cocoa controversy between the FDA and the Biscuit and Cracker Manufacturers is the total rejection of the manufacturers' position by the FDA.

The situation, by no means a clear-cut one, involves not only matter of fact but considerable speculation on both sides regarding what people think chocolate tastes like.

The FDA started the whole business "on the basis of consumer and industry complaints" by selecting for action cases involving the substitution of cocoa for chocolate in "so-called 'chocolate' products."

Involved were products for which there are standards of identity under the law, and products for which, as FDA puts it, "we believe there are standards of identity in the public mind."

The Biscuit and Cracker Manufacturers Association points out that the source of chocolate flavor is the cacao bean. They also state, in effect, that the consumer is concerned with "chocolate" flavor as he has always understood that flavor to be. He is not concerned with differences between chocolate liquor and cocoa or combinations of the two.

According to the industry's counsel, Joseph M. Creed, "a cookie, wafer or cake is properly labeled 'chocolate' when the flavoring ingredient is either chocolate liquor or cocoa or a combination of the two."

He also points out that cocoa is not inferior to chocolate liquor but is actually the residue from chocolate liquor after part of the virtually flavorless cocoa fat is removed from chocolate liquor.

Mr. Creed sums up the industry position by saying that the chocolate flavor of a product must satisfy the consumer or else it will be denied consumer acceptance and "will disappear from the market place."

He concludes by saying that the use of the word "flavored" in combination with "chocolate" would not only be redundant but would work an unnecessary hardship on the biscuit and cracker manufacturers.

In rebuttal for the FDA, M. R. Stephens, Enforcement Bureau Director, points to existing standards of identity in which, "a clear distinction is made between chocolate and cacao."

Chocolate is reserved for those products in which the ingredients derived from the cacao bean have 50% or more cacao fat. If less than 50% cacao fat, then the term cocoa should be used.

Taking his own look into

the crystal ball, Mr. Stephens said if one followed the industry position to its ultimate, "any cookie that looks and tastes like a 'chocolate' cookie is in fact such a cookie to the consumer whether or not it has any cocoa or chocolate in it."

This hypothesis, which FDA, not the manufacturers, set up, Mr. Stephens promptly rejects. He concludes that FDA has no alternative but to continue to take "appropriate regulatory steps when we encounter so-called 'chocolate' cookies or wafers which, in our opinion, are misbranded to the serious detriment of the public."

The chocolate issue is joined but by no means resolved. Mr. Creed reports to FOOD PROCESSING that he and his associates have Mr. Stephens' reply under study.

New NRC report on safety of emulsifiers

A revised report of the Food Protection Committee on mono- and diglycerides concludes that lauric acid esters are safe as intentional additives in foods.

In 1952 the Food Protection Committee of the National Research Council issued its original report on the safety of mono- and di-glycerides. A detailed study was made of these emulsifying agents because of the "unresolved controversy" resulting from FDA hearings to establish standards for bread and ice cream.

In the 1952 report it is stated that the conclusion that mono- and diglycerides are safe does not apply to monolaurin (and by implication, dilaurin).

"Evidence that this limitation is not justified is now overwhelming," the committee commented.

The experiments reviewed indicate that lauric acid esters are not completely satisfactory nutritionally when they are the sole source of fat in a diet. The report points out that this

Mr. Irving Bessner checks the candy on a 170-foot USS Cyclone Conveyor belt.

Mr. Henry Schuemann, Assistant General Superintendent for all plants of the Curtiss Candy Company, Chicago, Illinois.

"Our candy cools while we're making it— on USS Cyclone Conveyor Belts"

"We've been cooling Baby Ruth candy on USS Cyclone Conveyor Belts for 35 years," reports Mr. Henry Schuemann, Assistant General Superintendent for all plants of the Curtiss Candy Company, Chicago, Illinois. "The installation of our two conveyor units was the first step in mechanization that has enabled us to increase production 100% in 40 years.

"Over 4,000,000 Baby Ruth bars ride this conveyor system every month. The bars enter a cooling room just after the application of peanuts to a hot coating of caramel. To keep them cooling evenly, air has to circulate freely around them. The only way this can be done, without letting the candy sit overnight, is through the mesh of a metal belt.

"The Cyclone units we use consist of 14 continuously moving belts. We've been very satisfied with their performance," says Mr. Schuemann. "Some of the individual belts in use now have lasted 5 years, and they've never given us any maintenance problems."

What about *your* plant? Is your production lagging because your materials have to be manhandled? An automatic USS Cyclone Conveyor Belt system can speed up your daily output by an amazing margin. The Cyclone line is the most complete line of metal conveyor belts offered by any belt manufacturer. Find out which one is right for your product—just send for our free booklet.

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How Durkee's Continuing Research Kept Coatings from Turning Gray

THE PROBLEM: *find a better hard butter.* Durkee's Technical Research Staff set out to find one. They wanted a hard butter that would produce confectioners' coatings with better performance characteristics than existing coatings. Specifically, they wanted high gloss retention, greater stability and resistance to bloom under all temperature conditions.

THE SOLUTION: *methodical.* Durkee research went to work. Coating after coating was tested in the laboratories . . . placed in cycling cabinets which duplicated shelf temperature changes . . . checked by taste panels . . . subjected to exact conditions encountered in the plant. Durkee even built a pilot plant with miniature equipment to simulate actual plant conditions. As a result, a hard butter for making coatings that met every industry requirement was developed. Durkee named it Paramount; confectioners call it "wonderful".

THE SIGNIFICANCE: *clear.* Durkee has been researching fats and oils for 40 years—and is still hard at it. The development of Paramount is typical of purposeful research continually in progress in Durkee's Technical Service Laboratories. Here is where we may be able to help you most whenever your product or process warrants further attention. We'd be glad to help. Just 'phone us or write.

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is the case also for such other naturally occurring fatty acid esters as those of stearic acid.

When lauric acid glycerides are fed in diets containing a variety of glycerides, there is no evidence of a specific toxic or harmful effect, the report concludes.

Just what their official status is, regarding FDA listing, could not be ascertained at the time FOOD PROCESSING went to press.

Revised report, publication 251, is available from National Academy of Sciences, National Research Council, 2101 Constitutional Ave., Washington, D.C.

Time extensions for indirect additives

By orders in the Federal Register of May 21, 1960 and June 15, 1960, FDA granted time extensions to indirect additives used in packaging and in food handling equipment.

Status of ethylene glycol cellophane as a fish wrap

Cellophane treated with ethylene glycol for use in wrapping fish fillets is illegal if use of the wrapper results in the addition of the chemical to fish. The ethylene glycol, used in the manufacture of cellophane to keep it from cracking in below-freezing temperatures, would be a food additive because it is not generally recognized as safe when present in fish.

FDA has received inquiries as to the status of any fish on the market wrapped in this material. (Ethylene glycol-treated cellophane has been taken off the market by the manufacturers and many are now using non-toxic propylene glycol as a substitute for treating cellophane.) FDA's Regulatory Management Director, Dr. K. L. Milstead, has said that the question is

continued on page 20

that's interesting

Time buyer

The food processor has pushed the hired girl out of the American kitchen, according to Dr. Paul F. Sharp, director of the University of California's Agricultural Experiment Station.

Concurring with the theme that convenience now is a major factor affecting consumer acceptance, Dr. George F. Stewart, chairman of the University's Dept. of Food Science and

Technology, believes that the main thing the housewife is trying to buy is time, to use elsewhere than in the kitchen. "Thus," he pointed out, "the costs of processing are legitimate."

For information on product at right, circle 7712 see information request blank opposite last page.

Cherry-Burrell equipment processes liquid eggs profitably for the SK Produce Co.

SK supplies liquid eggs for bakeries and mayonnaise manufacturers. The product must be pasteurized and carefully processed to meet very high quality standards. SK wasn't satisfied with existing processing systems. They were too costly, too complex. The Company asked Cherry-Burrell to design a new one.

Cherry-Burrell engineers tested the product in their laboratories and devised a system built around the Superplate Heat Exchanger Pasteurizer. The system features fully automatic controls.

The continuous, closed circuit system pasteurizes liquid eggs in one complete operation — processes 6000 pounds per hour, a profitable volume, especially with the system's cost-saving advantages over the previous step-by-step method.

The closed circuit protects against contamination. The final product meets all standard bacteria destruction requirements. And automatic temperature controls help produce a consistently good product. Result: economically produced, high quality liquid eggs for SK customers.

Highly trained technicians will test your product without obligation in a Cherry-Burrell laboratory. They will show you how Cherry-Burrell food processing equipment can help you improve your operation and profit position. Your specialists are invited to participate in the testing. Call or write Cherry-Burrell today.

Equipment for homogenizing, heating, cooling, flavorizing, storing, separating, freezing, mixing, packaging and conveying. Write for your free catalog.

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food regulations

continued from page 18

whether the fish contains the ethylene glycol. As yet, there is no proof that the substance migrates to the fish.

"Unless evidence develops which shows that it is necessary to take legal action in order to protect the public health, we do not anticipate that any legal action will be called for against residual stock of fish wrapped in these wrappers," Dr. Milstead said.

Saffrol being eliminated from root beer formulas

Saffrol, chief flavoring ingredient for root beer, is not on any of the direct additives lists. Outside experts have been asked to look at it but an FDA official told FOOD PROCESSING that no decision has been made as yet on its safety or toxicity.

Because of the doubts that have long existed on the regulatory status for saffrol, some of the largest bottlers have revised root beer formulas to eliminate this ingredient.

FDA time extension for radiation instrumentation

FDA has granted an extension of time to the following two sources of radiation used for inspection of foods, food packages and control of food processes:

1. Sealed sources of radiation from radioactive isotopes (strontium 90 and cesium 137) at energy levels not exceeding 2.2 million electron volts.
2. X-radiation at energy level of 300-kilovolt peak.

Goats included under Humane Slaughter Act

Humane Slaughter Act regulations have been amended to include goats among animals that can be humanely stunned by electrical means before slaughter, USDA has

announced.

Previously, electric stunning was approved for swine, sheep, calves and cattle.

Reminder: Packers and processors offering meat products for sale to Federal agencies after July 1 **must comply** with the Humane Slaughter law.

Lists exemptions for trichina treatment

A list of pork products in consumer size packages has been exempted from treatment to destroy live trichina because the products would not be eaten without further cooking.

The list, promulgated by the Meat Inspection Division of USDA includes cured, unsmoked boneless pork shoulders, pork shoulder butts, or pieces of pork loin in casings or similar wrappings of consumer size.

The USDA also announced that cured products of this kind in consumer size packages shall not contain more than 10 per cent added substances as a result of the curing process.

Revised live lamb, sheep standards now in effect

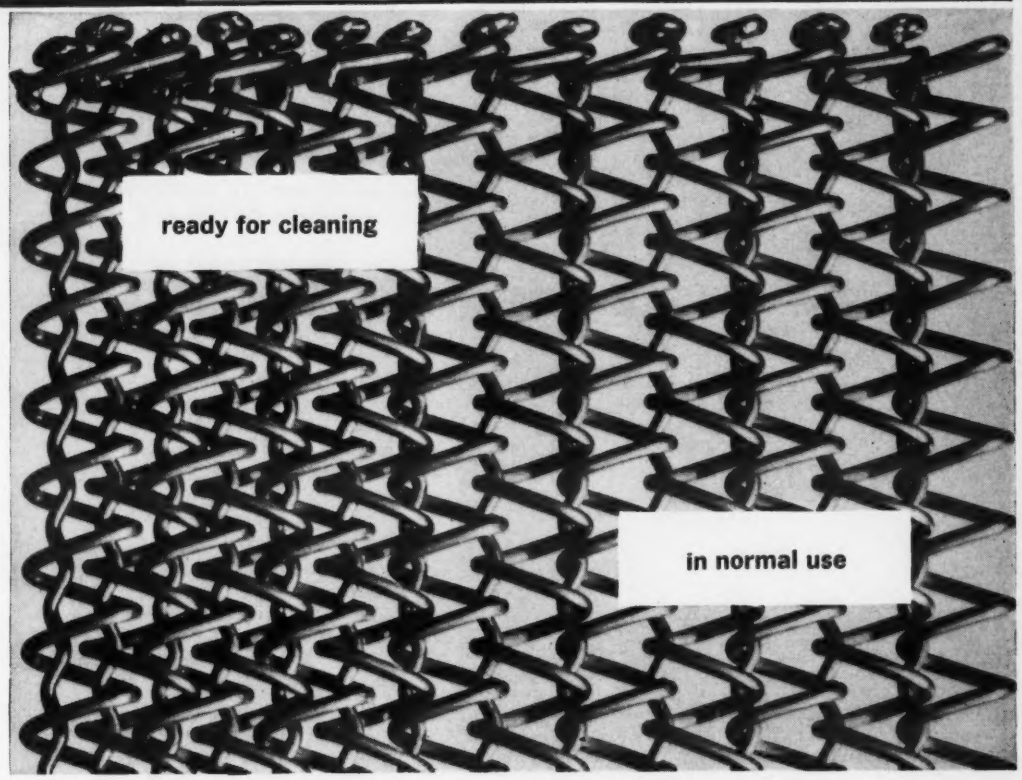
New revised USDA standards for live lamb and sheep are now in effect. The revisions are similar in nature to those adopted on March 1 for lamb, yearling mutton, and mutton carcasses.

The changes are expected to have the effect of lowering average fatness in the Prime and Choice grades. There should also be a substantial increase in the number of animals eligible for the Prime grade, under present production and marketing practices.

Both conformation and quality requirements for the Prime and Choice grades are reduced under the new standards. Conformation requirements are lowered about one-half grade.

Quality requirements, pri-

new *Cambridge* **COLLAPSIBLE METAL-MESH CONVEYOR BELT GIVES INSTANT SANITIZING**



Now, you can meet even the most rigid belt sanitation requirements—in just a fraction of the time formerly required—because the unique design of the new Cambridge Collapsible Belt allows each component part to separate completely for fast, thorough cleansing.

Just slacken the belt and bacteria and odor-producing food particles, oils and greases are instantly flushed away with the cleaning solution. Food products stay pure and wholesome . . . production stays at a peak . . . maintenance costs and down time are cut drastically.

The Cambridge Collapsible Belt is available in any length or width in the Balanced Weave, and can be woven from any metal or alloy, including stainless steel.

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Food processors are turning more and more to the use of Safflower oil. For good reason: Research relates Safflower oil to the reduction of cholesterol in the blood. Safflower oil is between 88% and 91% unsaturated*. It contains between 74% and 79% linoleic acid—*contains more essential fatty acids than any other available vegetable oil or shortening**.

Other attributes, such as clear color, non-reverting flavor and complete palatability make Safflower oil one of the most versatile ingredients in the food field. Let this dramatically different ingredient give your product a new point of difference. Write for literature and samples today.

**Basis total fatty acid analysis.*

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by PVO Process

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marily amount of external fat in relation to the age of the animal, are reduced between one-half grade and one full grade.

Copies of the revised standards may be obtained from the Livestock Division, Agricultural Marketing Service, USDA, Washington 25, D. C.

Meatier poultry required to qualify as US Grade A

Starting this month, poultry breasts must be meatier to qualify for "US Grade A" under revised standards now in effect.

The revision also provides new standards and grades for poultry parts so that consumers may be able to buy, for example, chicken or turkey legs, US Grade A.

Other changes in the revised standards include:

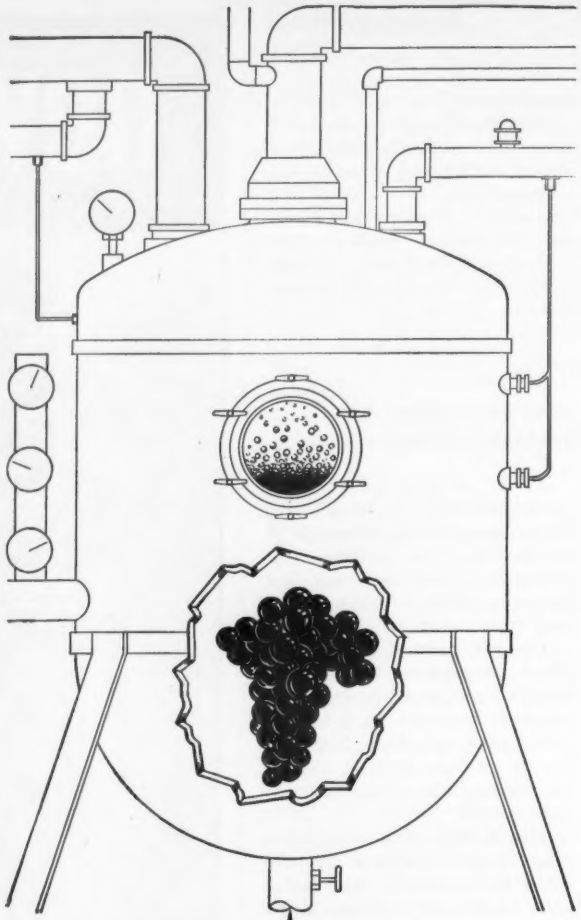
1. New wholesale and procurement grades.
2. Modification of charges for Government grading service.
3. Provision to limit use of the official letter grade mark (US Grade A, B, and C) to individually graded, ready-to-cook poultry.
4. Partial redefinition of the standards so that they may be applied more uniformly.

Copies of the revised standards are available from the Poultry Division, Agricultural Marketing Service, USDA, Washington 25, D. C.

Bacteria growth at 20°F?

In last month's article "Zero the desirable goal . . . " some lines were dropped which obscured the sense of a statement on bacteria growth at low temperatures. The complete statement follows:

It is generally agreed that while pathogenic organisms may survive freezing temperatures, they do not multiply at temperatures below 20°F. Some yeasts and molds may make very slow growth at temperatures below 20°F, but this growth is not likely to be



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significant from a public health standpoint. For a report on recent actions taken on the AFDOUS Zero Code, see pages 29, 30 and 31.

How to safely use agricultural chemicals

USDA has published three new leaflets themed to "it pays to use chemicals safely." Each leaflet points out that chemicals cut costs and improve production, but must be used properly to be safe.

Leaflets include: Leaflet No. 470, addressed to the field crops producer; Leaflet No. 471, for the fruit and vegetable producer; and Leaflet No. 472, addressed to the livestock producer. Leaflets are available from the US Government Printing Office, Washington 25, D. C., at five cents each.

Revised labeling manual available from NCA

The National Canners Association has issued the fourth revision of "Modern Labels for Canned Foods." The publication, which has served the canning industry for many years, is a convenient summary in looseleaf form of labeling terms and the federal regulations that affect them.

Initial mailing copies of revised labeling manual are being sent to headquarters office of each member of N.C.A. and of the Label Manufacturers National Association.

Interested non-members should write the Office of the N.C.A. Secretary (1133 20th St., NW., Wash., D. C.). Each request for the manual will be considered separately.

FDA STANDARDS

Artificially Sweetened Fruit Jellies, Preserves or Jams: A hearing has been scheduled for July 5 to hear evidence on two proposals of the National Preservers Association.

In the first phase of the hearing, objections to the order establishing standards for

continued on page 120

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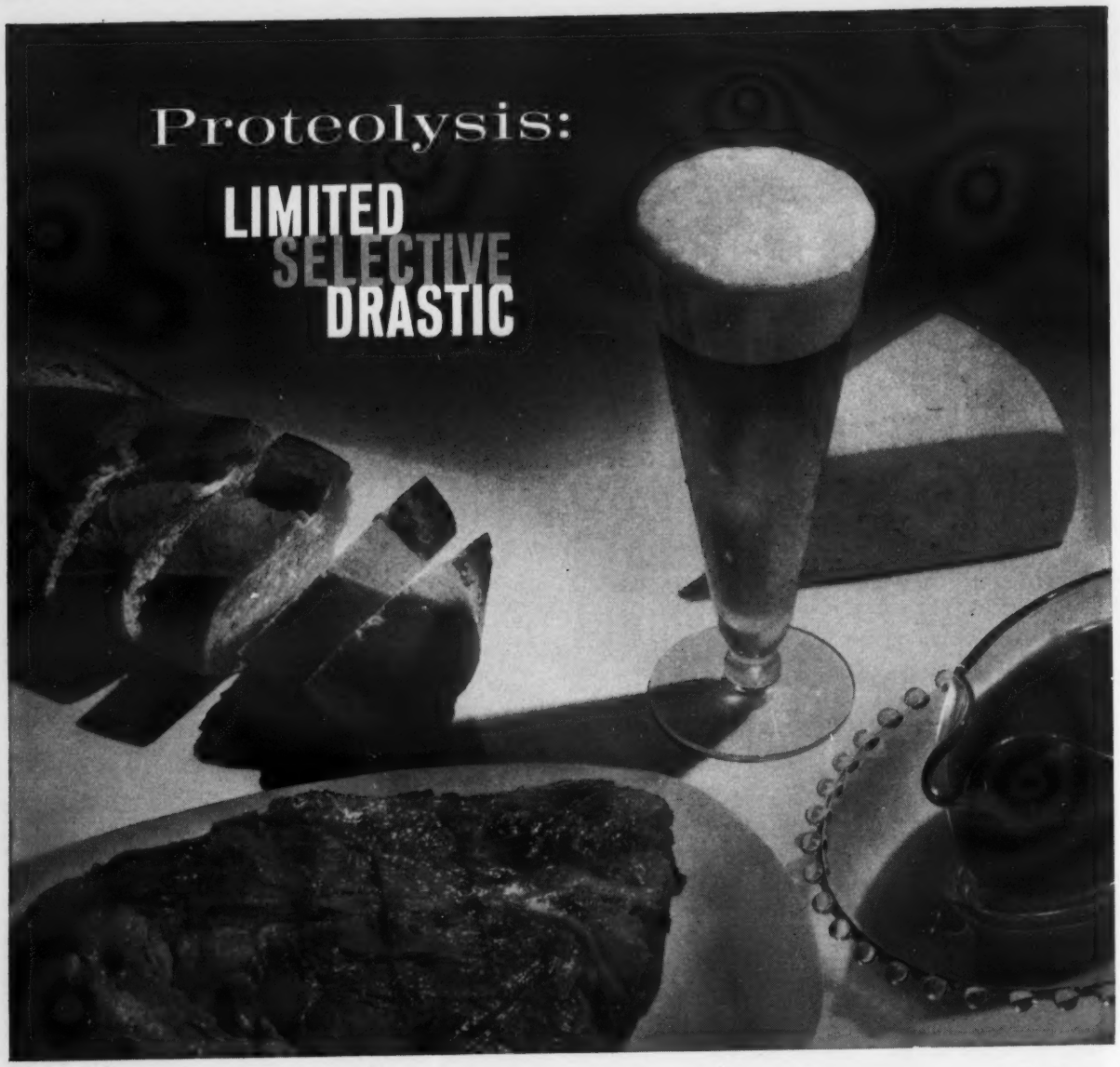

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association news

J. L. (Larry) Heid

Tri-Valley Packing Assn., San Francisco, has appointed **J. L. (Larry) Heid** to the newly created position of manager, research and development. Heid formerly was food industry sales manager for Cherry-Burrell Corp., and earlier had been editor of Western Canner & Packer.

More than a dozen full tuition scholarships, plus an allowance toward living expenses, are again being offered by **American Institute of Baking**. Applications for these scholarships are invited at any time during the year, and selection of recipients is made semi-annually for the 20-wk courses starting, respectively, in August and February. For scholarship consideration for the August 1 to December 17 course, address Alpha Carlson, Registrar, American Institute of Baking, 400 E. Ontario, Chicago 11, Ill.

The latest research methods and findings concerning food additives, athersclerosis and other aspects of nutrition will be presented at the **Gordon Research Conferences on Food and Nutrition**, to be held August 8-12 at Colby Junior College, New London, N.H. For information address Dr. W. George Parks at this address.

Dr. John Litchfield — most recently assistant professor of food engineering at Illinois Institute of Technology, Chicago — has joined the staff of **Battelle Memorial Institute**, Columbus, Ohio, where he will head up research studies in food technology and fermentation with the Biosciences Division.

Statement by

Franklin M. Depew

Newly Elected President of The Food Law Institute

— exclusive to FOOD PROCESSING

The basic mission of The Food Law Institute was reported in the September 1959 issue of FOOD PROCESSING. This mission has been, and continues to be, one of public service.

The FLI will continue to serve as the means whereby the food industry makes its contribution to the national welfare by promoting a better understanding of our food laws.

The leadership of Mr. Charles Wesley Dunn, as the first and only FLI president until his death last November, made the FLI a major instrument in furthering this contribution.

It is the intention of The FLI to continue its basic activities of education in these laws through its programs of essential law school instruction, its research projects and publications and its sponsorship of meetings with government and industry, at which all interested parties may confer about their mutual problems.

Through these programs, we believe The FLI can be effective in promoting sound and uniform food laws in harmony with our free institutions not only in the United States, but in other countries throughout the free world. Such laws are essential for free and orderly commerce in food products.

The importance of the food law in this country has been greatly augmented by the recent Food Additives Amendment to the Federal Food, Drug and Cosmetic Act.

Under this amendment, even substances which come in contact with food, such as packaging materials or processing equipment, may constitute a food additive within the meaning of the amendment.

This is so because the amendment broadly defines the term "food additive" to mean any substance which may be expected to become a component or otherwise affect the characteristics of food if such substance is not generally recognized as safe.

Thus, if a substance migrates from the lining of a storage tank, pipe or other part of the processing equipment, or from the package to the food — and that substance or the substances resulting from interaction is not generally recognized as safe (GRAS) — the food will contain a food additive within the meaning of the amendment.

These changes place a new and primary social responsibility on the food processor and his suppliers. It is now their joint responsibility to take the necessary steps to assure the safety, purity and integrity of the final article of food which has come in contact with these many and varied processing substances.

To execute this responsibility intelligently requires the advice of food scientists as well as the guidance of others trained in the understanding and interpretation of the law. The FLI will continue to help supply personnel trained in this law through its educational programs.

A program of high interest and importance to the public generally as well as to industry will be the next annual FDA-FLI national conference in November.

This conference promises to afford another opportunity for the exchange of valuable information about this new amendment which should point the way to the solution of some of the many problems presented by it.

Franklin M. Depew, with the Legal Department of Standard Brands, Inc., since 1934, and a specialist in food and drug laws, is the second President of The Food Law Institute.

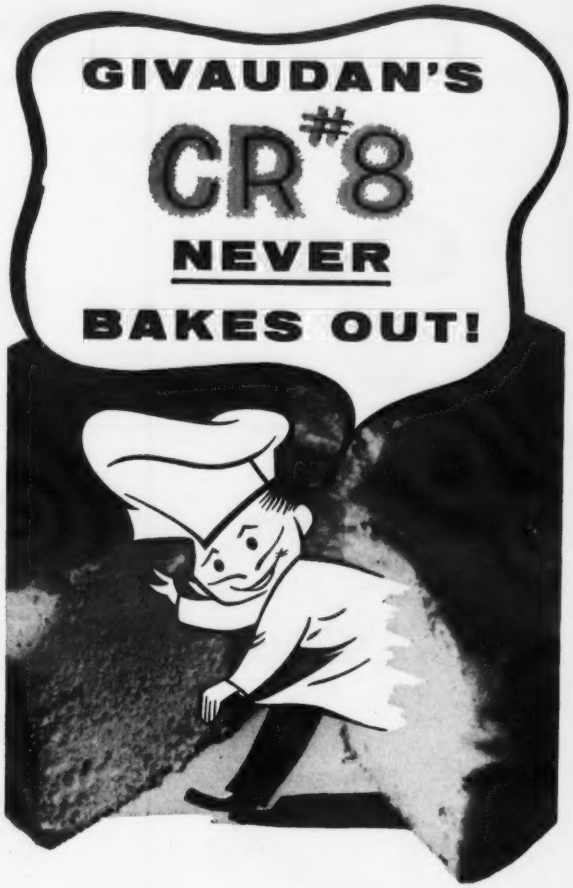
He succeeds the late Charles Wesley Dunn, who served as Institute President from the organization's inception in 1949 until his death in November 1959.

Mr. Depew is a member of the Section of Food, Drug and Cosmetic Law of the New York State Bar Association; a former member of the Special Committee on the Revision of the Regulations of Practice at Hearings before the Food and Drug Administration; a charter member of the Division of Food, Drug and Cosmetic Law in the Section on Corporation, Banking and Business Law of the American Bar Association and also of its Committee on Food Standards.

The new Institute head co-authored a volume on General State Food and Drug Laws in the Food Law Institute Series, and served for several years as editor of Notes and Comments, a feature of the Food Drug Cosmetic Law Journal.

He also is author of several articles on various aspects of the food laws, and acts as special lecturer on food and drug laws in the Food Law Institute program at the New York University School of Law.

A complementary additive to vanilla flavors...



Baked products faithfully retain their vanilla odor, taste and flavor strength when Givaudan's C. R. #8 is used as a fixative. Its resistance to high as well as low temperatures has been *proved in actual use* by the baking, candy and ice-cream industries. C. R. #8 is soluble in alcohol and propylene glycol. C. R. #12 —a variation of C. R. #8—is also soluble in vegetable oil. Both are coumarin-free.

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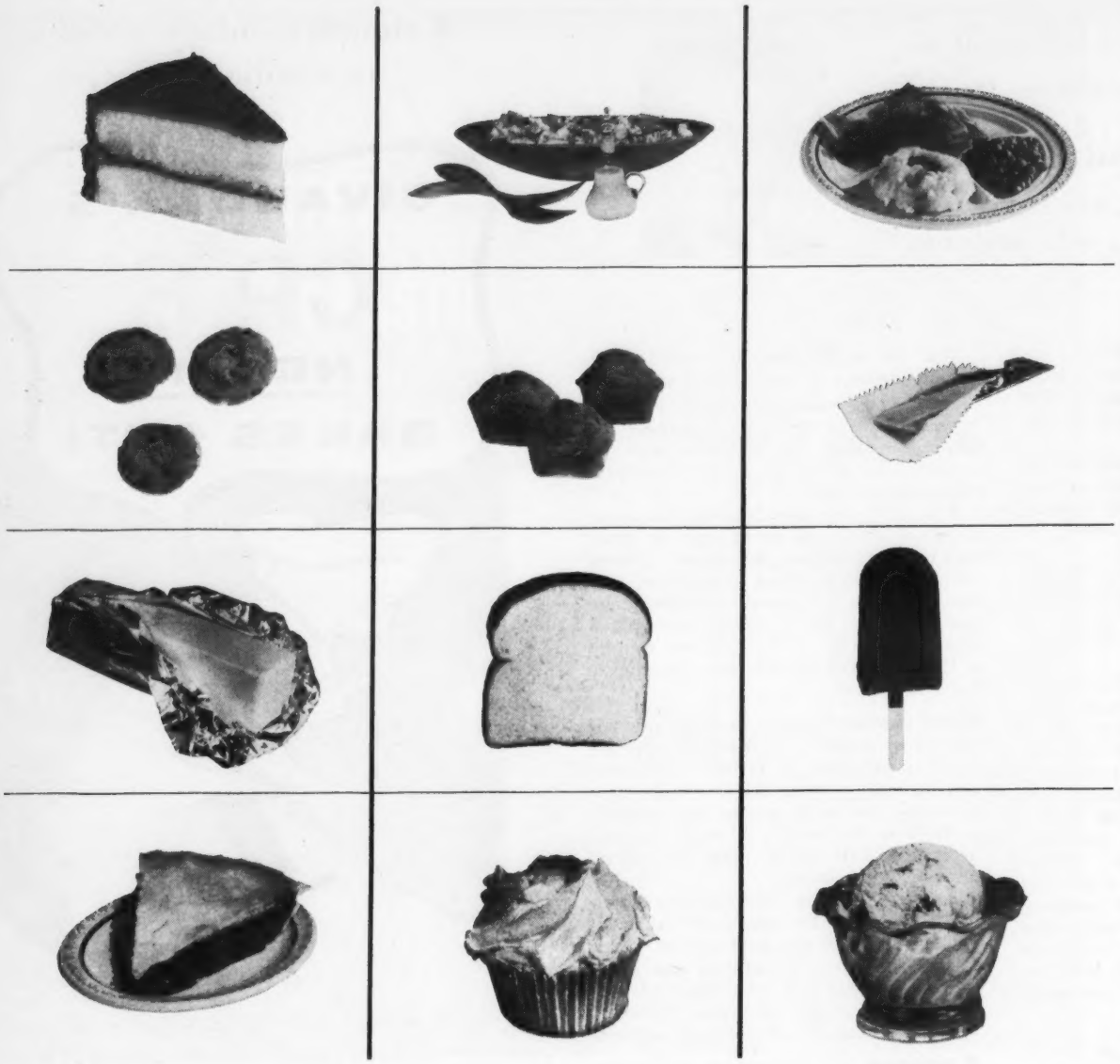

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plants companies personalities

Pet Milk Co., St. Louis, has promoted **Harry E. O. Heineman** from director of product development to director of research and development. Before joining Pet in 1945, he had been director of research and education for the Evaporated Milk Assn.

Heineman

Gillett

Eugene C. Gillett, most recently production manager of the **California & Hawaiian Sugar Refining Corporation's** Crockett, Calif., refinery — the world's largest cane sugar refinery — has been appointed technical advisor to the vice president-operations.

General Foods Corporation has acquired the assets of **California Vegetable Concentrates, Inc.,** Huntington Park, Calif., a producer of dehydrated vegetables for the food processing industry.

To increase production for West Coast consumption, **J. M. Smucker Co.** has begun construction on a $1,000,000 plant and warehouse in Salinas, Calif. The 65,000-sq-ft building will increase Smucker's over-all production potential by 40 per cent.

Lever Bros. Co. has named **Dr. Willard M. Bright** research and development vice president, succeeding **Dr. L. B. Parsons** who continues as a vice president and director.

The **Birds Eye** division of **General Foods Corp.** plans to build a $1 million instant baby food production plant on a 51-acre site in Canandaigua, N.Y. Completion of the 180,000-sq-ft facility is expected in mid-1961.

For other news of Plants, Companies and Personalities see pages 79 and 93.

A. Charles Scott has been advanced from forward planning engineer to vice president in charge of production at **Curtiss Candy Co.**, Chicago. Before joining Curtiss in January 1960, he had been vice president in charge of production for Cherry-Burrell Corp., Cedar Rapids, Iowa.

A. C. Scott

R. F. Myers

Refined Syrups & Sugars, Inc., Yonkers, N.Y., an affiliate of Corn Products Co., has promoted **Raymond F. Myers** from vice president for transportation to the newly created post of vice president in charge of manufacturing and transportation. Thomas M. Brown, vice president for manufacturing since 1938, relinquished his post for health reasons, but will continue as a vice president.

The USDA's Superior Service Award was presented by Agriculture Secretary Benson to **Dr. C. O. Willits**, who heads maple-syrup investigations at the Agricultural Research Service's Eastern Utilization Research and Development Division in Wyndmoor, Pa. One of three individual award winners from the USDA's utilization research program, Dr. Willits over the past 10 years has helped revolutionize the nation's syrup-making industry through personal research work, staff direction, instrument design, technical writings and field instruction of local processors.

H. S. Gabbert, formerly flour production superintendent, at **General Mills'** San Francisco plant, has been appointed manufacturing superintendent for the company's **Sperry** operations in the western states, succeeding **Alden Ackels** who has gone to another milling company. He will supervise production of five flour mills and a packaged food plant.

3 YEAR JUICE TRENDS ANALYZED

New national study reveals the changing juice consumption habits of urban America

Covers virtually all flavors of fruit and vegetable juices and fruit drinks in ready-to-serve, concentrate and chilled forms. Provides complete—easy-to-interpret—graphic analyses . . . vital to executives and market planners in the fruit and vegetable juice industry.

- compares summer '57 with summer '59
- pin-points regional markets for these products
- shows who drinks the products
- discusses changes in taste preferences
- container size mix for fruit drinks

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F-M ADAPT-*ABLES are "NEMA-Matched"*: pump mounting dimensions are standardized with similar dimensions of Nema-driving motors. Gone is the need for make-shift height-adjusting blocks and odd-bore couplings!

The ADAPT-*ABLE* design means that the most economical frame size may be selected to match the motor horsepower requirements of the pumping job.

And there are other advantages: choice of mechanical seals or conventional stuffing boxes with easy field change-over from one to the other . . . interchangeable bearings for pumps and motors. For special liquid handling problems, hydraulic ends can be specially alloyed to fit the needs: we've been solving such problems for generations.

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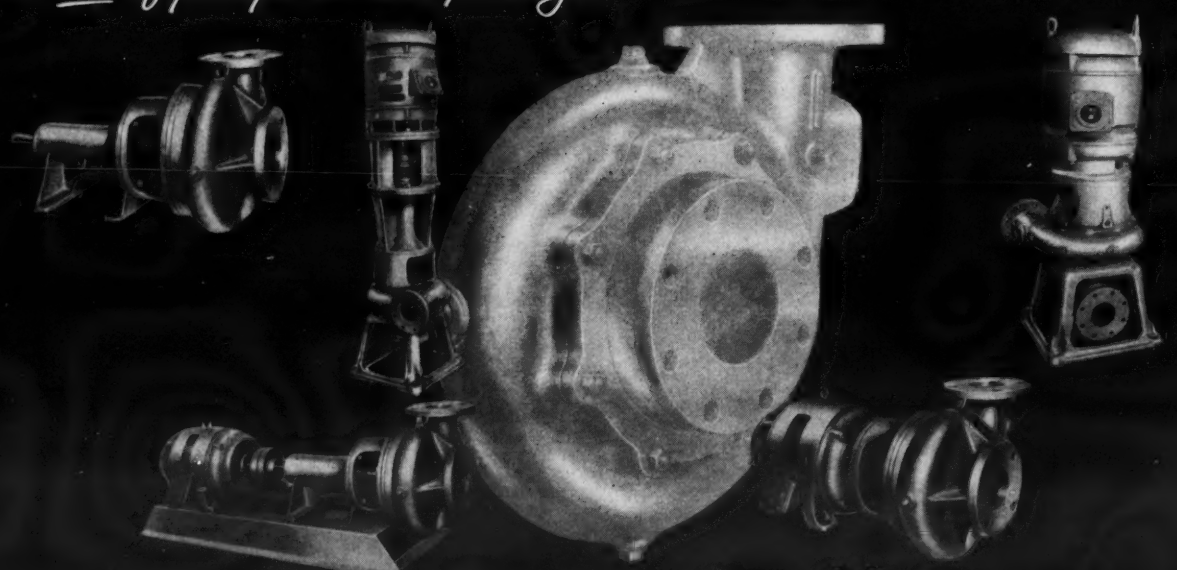
. . . a lot of pumps in ONE package!



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THE MAGAZINE OF APPLIED TECHNOLOGY
FOR MEN WHO MANAGE
FOOD PROCESSING
JULY 1960
VOL. 21 NO. 7

SPURRED BY THREAT OF UNREALISTIC AFDOUS CODE

Industry unites to achieve better handling of frozen foods

HOWARD P. MILLEVILLE
Editor

AFDOUS postpones action on adoption of zero code for a year, thus giving industry an opportunity to demonstrate that it can achieve results voluntarily

At its annual meeting last month, AFDOUS* rejected industry's suggestions that the proposed frozen food code be used only as a guide or reference and not as a law, regulation, or ordinance by regulatory agencies.

AFDOUS did suggest, however, that sections of the proposed code as published or reprinted contain a statement advising States and Municipalities that ". . . these sections as they appear herein are not suitable for adoption in this form."

By issuing this suggestion, AFDOUS clearly labeled as premature the law based on the proposed code by the State of Massachusetts, which goes into effect August 1.

The proposed AFDOUS Code continues to call for all frozen foods to be held at 0°F or lower but does allow temporary deviations up to 10°F for such operations as defrost cycles, loading and unloading, and other temporary conditions beyond the control of the persons or company under whose care or supervision the frozen food is held.

AFDOUS commended the over-all frozen food industry for its program to develop its own integrated standards of quality-control practices and industrial self-policying program. AFDOUS recognized the value of such a program, but it would not agree to it as a substitute for an AFDOUS code.

The Association, however, did request that the over-all industry group submit a progress report to it next December and a final report by June 1, 1961.

Milton P. Duffy, Chairman of the AFDOUS Frozen Food Standards Committee, indicated to FOOD PROCESSING that he is interested in industry doing more than submitting reports discussing problems. He said: "The time has come for industry to demonstrate results!"

*Association of Food and Drug Officials of the United States, which is the largest and most influential organization of government officials from all levels of government — both local and national.

Common objective

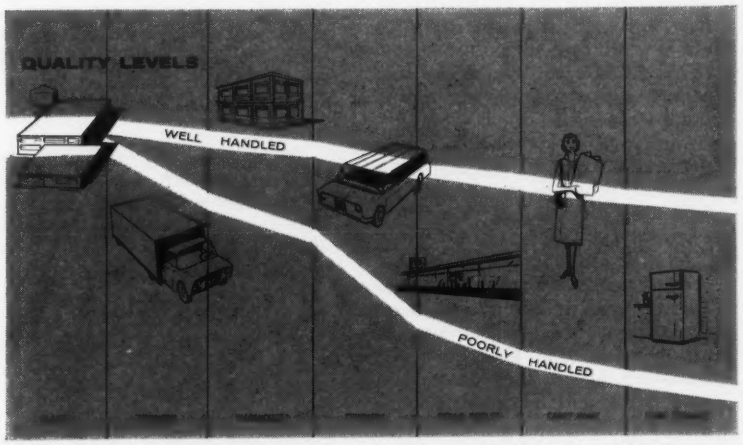
While AFDOUS and industry disagreed on how frozen foods should be regulated, it is apparent that their objectives are in many respects identical.

Frozen foods are generally agreed to be a superior product insofar as quality is concerned. But their quality is perishable and can be lost through mishandling even though not mishandled sufficiently to result in spoilage from the standpoint of public safety.

The objective of all concerned is to set up standards for processing and subsequent handling which will guarantee a sufficient margin of quality protection when the frozen foods are purchased by the ultimate consumer.

The key to progress in realizing this objective is better handling of frozen foods by *all* those who participate in the marketing of frozen foods.

Thus, while slight mishandling at any one step will not result in an observable deterioration of quality, the cumulative effect of slight mishandling at several steps can result in loss of prime quality before the frozen product reaches the consumer. A quantitative illustration of how this can happen is presented in the accompanying chart, which was first published in the April, 1958, issue of FOOD PROCESSING.



Better handling by all those who participate in the marketing of frozen foods is the key to maintaining quality at a high level

All agree that mishandling

Frozen foods handling continued

must not be tolerated at any step, and that an improvement in the general quality of frozen foods will increase the sales potential of frozen foods. But although this quality improvement is the objective of the AFDOUS code, its provisions are unrealistic according to industry.

If the code was to be made into law today and strictly enforced we would have a good portion of the frozen food industry forced out of business . . . and not because their product is unsafe from a public health standpoint.

AFDOUS acknowledges that some leniency in enforcement is initially desirable and has recommended that an administrative tolerance be allowed. But industry is afraid of secret tolerances.

"Attempts to enforce the presently unattainable would only lead like National Prohibition to corruption of enforcement officers and to travesties of justice," according to the National Frozen Food Association.

9 associations organize

The threat of unrealistic legislation based on the AFDOUS code has, however, had the salutory effect of uniting various segments of the industry into positive action towards achieving better quality in frozen foods.

In May, nine national trade associations joined together in a uniform program to coordinate frozen food handling from processor to retailer.

In announcing this program, the organizations stated that the frozen food industry has long recognized the desirability of achieving a 0°F goal, but the achievement of this goal in a reasonable and practical manner includes recognition of the responsibility of industry to continue to provide the public with adequate supplies of quality frozen foods without interruption.

The frozen food industries vigorously oppose the adoption as statues or regulations of the AFDOUS Code, with its unrealistic provisions, and will oppose adoptions of such a code as a regulatory measure for application at any industry level, for it would deprive consumers of substantial supplies of frozen foods.

An industry cooperative program is offered as the most practical means of achieving the goal of maintenance of optimum quality of frozen foods.

Subsequently, an all-industry coordinating committee was formed. It is chairmaned by Dr. H. C. Diehl, former Executive Director of The Refrigeration Research Foundation. This committee is sponsored by the following trade associations:

- American Meat Institute
- American Trucking Associations
- Institute of American Poultry Industries
- National Association of Food Chains
- National Association of Frozen Food Packers
- National Association of Refrigerated Warehouses
- National Association of Retail Grocers of the U.S.
- National Fisheries Institute
- National Frozen Food Association

The following statement was presented on behalf of the committee by Dr. Diehl to the AFDOUS Frozen Food Standards Committee on June 4:

"The [all-industry coordinating] committee, representing all facets of industry concerned with frozen foods, most sincerely commends AFDOUS for stimulating the voluntary and cooperative industry action toward maintaining optimum commercial quality in frozen foods. The committee requests the understanding and cooperation of AFDOUS in the industry program.

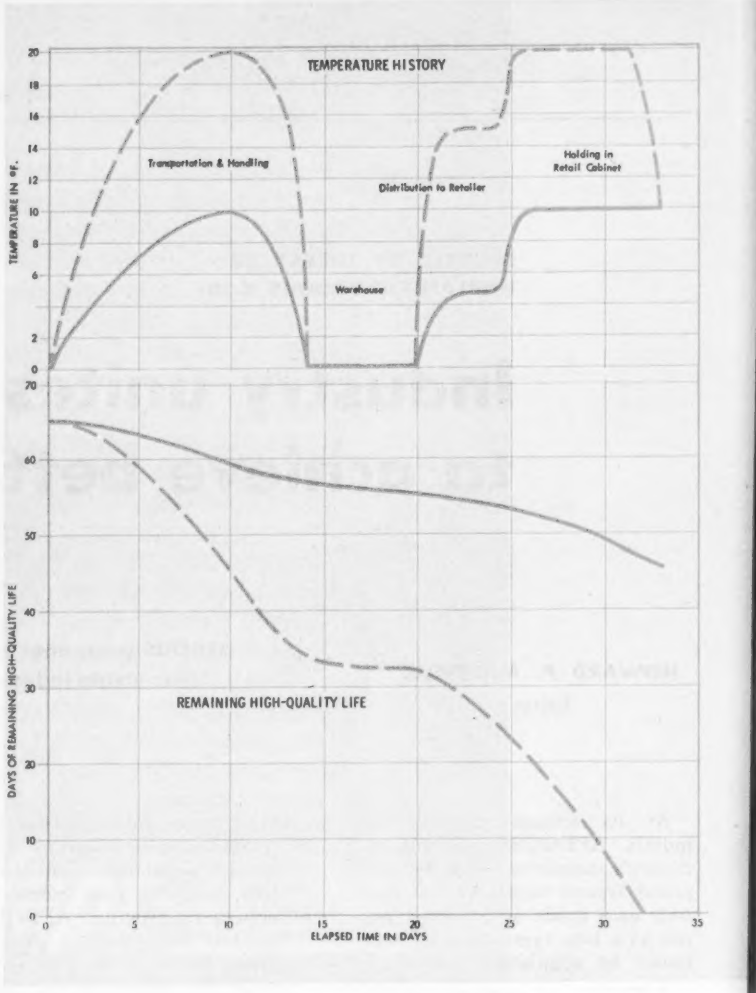
"The committee is developing its own integrated Standards of Quality Control Practice and while it pledges itself to seek the advice and counsel of AFDOUS members and of regulatory officials, and solicits their understanding cooperation, it proposes to initiate, on its own responsibility and decisions, these standard practices in an industrial self-policing program.

"The committee asserts that until such a time as a voluntary quality control program is demonstrated to be ineffective or failing to meet the desired objectives, a carefully revised AFDOUS Code should be considered only as a stand-by enforcement potential, application of which will require mutual agreement between the committee and AFDOUS.

"The committee requests that AFDOUS suggest to its members deferment of any statutory or regulatory action on the Code for one year in order that (1) adequate joint consideration can be given to revisions of the several sections of the Code, as suggested by the industry groups through the committee, (2) such additional research and study as is required to make the standard practices adequate, realistic and practicable, can be initiated, and (3) the all-industry program now initiated can be undertaken and evaluated in actual practice.

"The committee has the opinion that such a period of time is required, without haste or pressure, for joint study. The finally adopted standard practices must be appropriate, realistic and industrially practicable, in order to continue to provide the American public with high quality frozen foods.

"The committee focuses attention emphatically on the findings of the extensive research of the Time-Temperature Tolerance Investigation of the Western Research and Development Division of USDA at Albany, California,



QUALITY VS TIME-TEMPERATURE

Case histories of good and poor handling

The prime quality of frozen foods is perishable even though they may be hard frozen! How rapid the loss of quality depends on the temperature. At zero Farenheit or below the prime quality may last a year or more . . . at 20°F, only a few days.

The chart at left demonstrates what happens to the quality of frozen strawberries subjected to two different temperature-time histories. It may be considered as typical for frozen foods in general, although some frozen foods lose their quality even more rapidly.

Strawberries will keep in top, fresh-fruit quality for about a year if kept at zero; have 65 days good quality life at 10°F; 5 to 6 days of good quality life at 20°F; and 1 day at 30°F. In the chart, quality is given as days of remaining high quality when stored at 10°F.

Temperature-time histories of two shipments are shown in the two upper lines, and corresponding quality in the two lower lines. Note that the shipment with the two 20°F peaks (dashed lines) has lost its fresh-fruit quality before the berries reach the consumers' hands.

The time-temperature-quality history of this typical shipment represented by dashed lines corresponds to transportation in a salt-ice reefer car, recooling and intermediate storage, followed by local distribution and retailing.

Better handling of the berries is represented by the shipment (solid lines) where the temperature does not exceed 10°F. When the berries reach the consumer they still have 45 days of fresh-fruit quality if stored at 10°F, and more, of course, if stored by the consumer at zero.

Basis for the quality lines in the charts is loss of ascorbic acid in the berries which corresponds directly to flavor loss, and which is more easily measured quantitatively in the laboratory. (Taken from "Frozen Foods' Tremendous Potential Lost Through Mishandling?", an article by Dr. M. J. Copley, Director, Western Utilization Research and Development Division, ARS, USDA, in FOOD PROCESSING, April, 1958.)

over a period of ten years and concurred in by The Refrigeration Research Foundation.

"These scientific investigations establish that quality change does not result solely from higher product temperatures, but more importantly, from length of time of exposure in relation to temperature. The above named organizations and other research agencies are actively continuing their investigative work in this field.

"In conclusion, the committee believes adoption and implementation of the program as outlined herein will best serve the interests of the consuming public, regulatory officials, and the industries involved."

As previously noted, AFDOUS rejected the suggestion that its code be used only as a reference and not as a basis for legislation.

Nevertheless, in a sincere effort to be more realistic in its actions, it did ask the over-all industry group to submit progress reports during the coming year. In addition, AFDOUS officially delayed adoption of the code as a basis for legislation to its next annual meeting.

5° lower every 2 years

An indication of what industry considers as a realistic code as a basis for legislation may be had from the National Frozen Food Association's answer to AFDOUS's request for some specific practical recommendations. (These were made May 9, 1960, prior to the formation of the over-all industry group.)

Whereas the AFDOUS Code has thusfar always specified temperature in terms of product, the Frozen Food Association's specifications relate to ambient air temperature as the most practical index for continuous or frequent checking. A summary of their recommendations are given in the table below.

Excerpts from the statement which accompanied these recommendations of the National Frozen Food Association follow:

"We further pledge continuous efforts to expedite the efficient handling in and out of vehicles and storage locations to the fullest extent that improved employee training, equipment and cooperation with allied segments of the industry will permit, so that exposures outside of refrigerated areas will be reduced to a minimum.

"We further believe that the industry can police its quality standards and detect violators more efficiently than could even hosts of government inspectors.

"Accordingly we approve of the setting up of Quality Standards Committees by the respective national associations of the industry or their local associations, these committees to stimulate educational efforts and research for more rapid progress toward the objective of a zero maximum and to serve as investigating media where serious violations, intentional or otherwise are reported.

"In any isolated areas, where continuing practices abusive to the quality of frozen foods may later be found to be so widespread, rather than exceptional, that governmental regulation is contemplated as a last resort, we approve of the cooperation of such Quality Standards Committees with governmental authorities to secure enforcement of these Industry Standards so as to provide uniformity between all States in behalf of all consumers." END

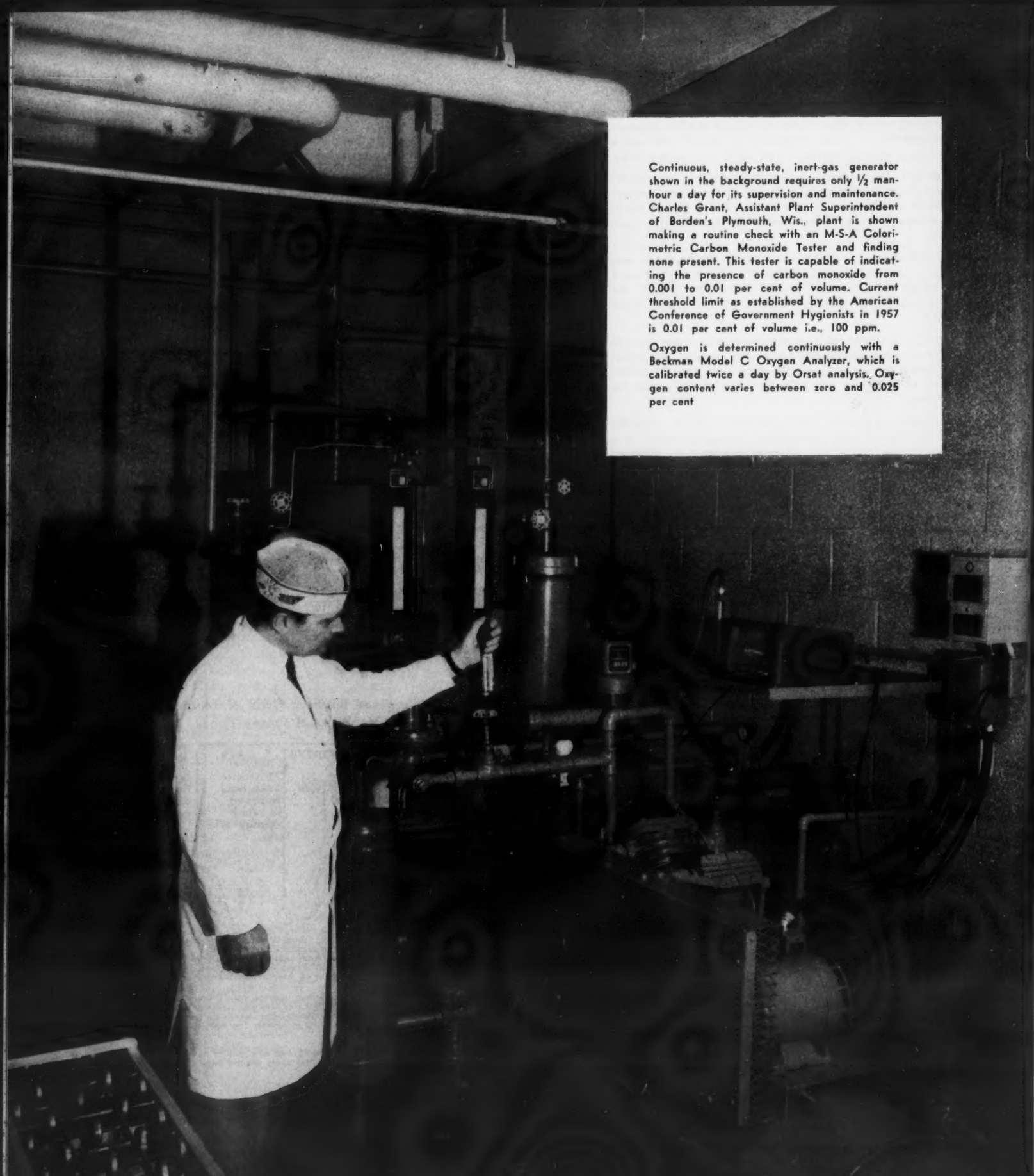
NFFA'S Proposed Realistic Code of Temperatures[1] for Handling of Frozen Foods

LIKELY TIME:	WEEKS OR MONTHS	DAYS	DAYS	HOURS
Location:	Public or private refrigerated warehouse	Long haul transport or retail storage area	Retail display cabinet	Short haul and distributing transport
Maximum AIR Temp. permissible after:				
Jan. 1, 1961	0°	15°	20°	30°
Jan. 1, 1967[2]	0°	0°	5°	15°

[1]Temperatures in this table are ambient air and not product temperature. Elsewhere the proposed specifications of the National Frozen Food Association state: "Specifically because we recognize the possibility of occasional personnel or equipment failures, we subscribe to the necessity of removing from salable stock all frozen foods found at any time with a temperature in excess of 20°, and the holding of the same segreted until adequate laboratory testing has indicated fitness for human consumption or proper disposal.

These temperature standards for distributing transportation are intended to apply uniformly to all deliveries of retail packs (5 lbs or less per package) to retail outlets which will subsequently resell products to consumers, but not to deliveries to institutional accounts where the purchaser-user may wish to specify the temperature desired at time of delivery to facilitate prompt utilization.

[2]It is estimated that research and new equipment availability should permit the reducing of industry maximum approximately 5 degrees every second year.



Continuous, steady-state, inert-gas generator shown in the background requires only ½ man-hour a day for its supervision and maintenance. Charles Grant, Assistant Plant Superintendent of Borden's Plymouth, Wis., plant is shown making a routine check with an M-S-A Colorimetric Carbon Monoxide Tester and finding none present. This tester is capable of indicating the presence of carbon monoxide from 0.001 to 0.01 per cent of volume. Current threshold limit as established by the American Conference of Government Hygienists in 1957 is 0.01 per cent of volume i.e., 100 ppm.

Oxygen is determined continuously with a Beckman Model C Oxygen Analyzer, which is calibrated twice a day by Orsat analysis. Oxygen content varies between zero and 0.025 per cent

When generated on premises even at rate of only 550 CFH

Oxygen-free gas is inexpensive

less than 4 cents per 100 cubic feet

THE cheese in Borden's sliced cheese packages is protected with an inert gas. In the packaging operation, the air is exhausted and then replaced with nitrogen.

Originally, the nitrogen was purchased in cylinders; however, once the success of the package was established, an inert-gas generator was installed to obtain the advantages of greatly reduced cost.

The inert gas generators used in Borden's cheese plants were obtained from Gas Atmospheres, Inc., Cleveland 16, Ohio. They remove oxygen from air by practically perfect combustion in a stainless-steel combustion chamber. Moisture of combustion is removed by condensing it out to a dewpoint 10 F above available cooling water.

First installation of such an inert gas generator was at their Monroe, Wis., plant. The gas generated went to an outdoor gas storage tank. When the tank reached 100 psig, it was analyzed for carbon monoxide before being used.

This procedure was followed to guard against a possible hazard to employees in the packaging area where some of the inert gas "spills" out of the packaging machine.

Experience in the operation of the first generator led to the conclusion that a more efficient method would be to run the generator continuously at optimum steady-state conditions, discharging gas generated to the atmosphere when not required by the packaging lines.

Even though only a minimum amount of manual supervision is required, the cost of the labor is still the major cost of the gas generated — see table. Hence, the new procedure which reduces the amount of attention the unit requires is actually more economical even though some of the inert gas is deliberately wasted.

The procedure at the Borden's Plymouth plant is as follows:

1. Purge system for 15 minutes, then start gas generator early in the morning, diverting gas to atmosphere and make adjustments as required for steady-state operation at zero carbon monoxide and 0.00 to 0.025% oxygen.

2. After steady-state operation obtained (about ½ hour), switch gas flow to compressor, which delivers it to compressed storage tank.

3. When pressure reaches 100 psi, gas is automatically diverted back to atmosphere exhaust, switching back to the compressor when pressure drops to 80 psi.

At the Plymouth plant, at day's end the gas generator is allowed to run until the storage tank is at 100 psi, so that a full supply of inert gas is available for the start of the following day's run.

7723 on Reader Service Slip.

Cost of inert gas

The inert gas generators installed at Bordens generate 550 CFH of inert gas from combustion of 56 CFH of natural gas. Hourly cost breakdown is as follows:

GENERATOR			
Fuel:	56 cu ft at 55c per M	$0.030	
Power	0.6KW @ 0.015 KWH	0.009	
Water:	240 gal @ 0.10 per M	0.024	0.063
COMPRESSOR			
Power:	2.2 KW @ 0.015 KWH	0.033	
Water:	60 gal @ 0.10	0.006	0.039
OPERATION AND MAINTENANCE			
Labor:	½ man-hour per day @ $2.50/hr prorated over a ten-hour day		0.125
	Total cost per hour		0.227
	Cost per 100 cu ft of inert gas		0.04

Borden's sliced cheese keeps fresh longer; inert gas in the transparent, flexible packages protects it against oxidative changes

IFT presents Industrial Achievement Award to inventors of development which . . .

Cuts processing of summer sausage products from 7 days to 48 hours

Lactic acid starter culture assures positive control of fermentation process to produce the "tangy" flavor traditionally associated with summer sausage, Thuringer Cervelat pork roll and a number of similar meat products

Plaque presented to American Meat Institute Foundation and Merck & Co., Inc. Similar plaques were also presented to each of the individual scientists instrumental in the development of the lactic acid starter culture

Summer sausage, which is a fermented meat product, can now be produced without the traditional chance and guesswork inherent in the process by which it has been made for centuries.

Key to the new production method is a lactic acid starter culture which positively controls the fermentation process in the manufacture of summer sausage products in as little as 48 hours.

Culture was developed by the American Meat Institute Foundation, Chicago, Ill., and made commercially available by Merck & Co., Inc., Rahway, N. J. Scientists from the Foundation and Merck collaborated in perfecting methods for growing the microorganism and for freeze-drying and shipping uniform supplies of the pure culture for use by industry.

In honor of the development, the Foundation and Merck were named as co-recipients of the 1960 Food Technology Industrial Achievement Award, presented at the recent annual meeting of the Institute of Food Technologists in San Francisco.*

Individual awards were also presented at the same time to those scientists who collaborated on the development (see photo).

Meeting with very substantial success commercially, the freeze-dried starter culture, marketed under the tradename of Accel, was used in the manufacture of more than ten million pounds of commercial sausage products in 1959. Conversion from the traditional to the new method of sausage production continues to expand rapidly.

Until the development of the lactic acid starter culture, processors of summer sausage products were forced to depend upon chance fermentation, which sometimes took as long as seven days to complete.

Because of the length of time required for initiation of fermentation using this chance method, processors encountered numerous problems of spoilage, off-flavors, nonuniform color, poor texture and nitrite burns, as well as limited production.

While the new process does not reduce the degree of control which must be exercised during production, it does reduce the length of the critical period during which fermentation takes place.

Thus uniform yields are produced much faster. And the final product maintains the traditionally "tangy" flavor associated with summer sausage, Thuringer Cervelat, Lebanon bologna, pork roll and similar sausage products.

*The second presentation of an annual award for the most outstanding development in food technology which has been successfully commercialized within the past four years.

FP STAFF

Process is similar in principle to that widely used for the production of various types of cheeses. A pure culture of carefully selected and completely harmless bacteria is used to start the fermentation process, rather than depending upon chance inoculation methods.

How to use. Starter culture, in powder form, is added to a small amount of water to create a suspension and to facilitate proper distribution when added to the meat mix.

This solution is thoroughly mixed with the ground meat to which cure, salt, spices and sugar have previously been added. At least ¾ of a pound of dextrose (corn sugar) must be used to accelerate the growth of the culture and thus assure early and rapid fermentation.

Additional sugar, sucrose (cane sugar), corn syrup solids or more dextrose may be added according to processors own formulation.

After mixing is completed, sausage is stuffed into casings of any choice and allowed to warm up to room temperature before being moved into the smokehouse.

Product is held in smokehouse at 80 to 100 F for varying lengths of time, depending upon final flavor desired. For it is in the smokehouse that the culture produces maximum lactic acid to achieve the final "tangy" flavor. END

IFT Industrial Achievement Awards were presented by Dr. Berton S. Clark (extreme left) Chairman of the Awards Committee. Shown receiving the awards are Dr. Charles F. Niven, Associate Director of Research and Education, American Meat Institute Foundation, who accepted the award for AMIF and also was individually honored; Dr. William H. McLean, President, Chemical Division, Merck & Co., Inc., who accepted the award for Merck; Dr. George D. Wilson, Chief of AMIF Division of Food Technology, recipient of an individual award; and R. P. Dudley, Merck Food Product Specialist, also recipient of an individual award. Absent when the award was made was R. H. Diebel, Associate Bacteriologist at AMIF, who was also one of those honored with an individual award

AMIF and Merck combined their research in this outstanding accomplishment

FROM RAW STORAGE

THROUGH PROCESSING

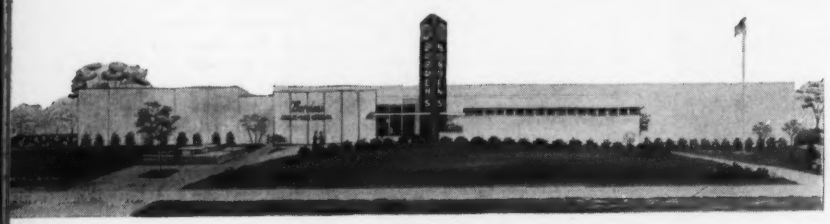
TO FILLERS

AT BORDEN'S NEW DAIRY PLANT

Single Operator Controls Complex O

Manipulates fluid flow through two remote-control panels in plant that also has 4 automatic CIP systems which pulsate flow valves for thorough cleaning

Borden's Milwaukee Region Plant



Costing over three million dollars, Borden's new milk and ice cream plant is the largest ever built in Wisconsin. It is the outgrowth of a business founded in 1886 when John Le Feber bought a farm outside Milwaukee.

Capacity of the plant is half a million quarts of milk a day. It can also manufacture 5,000,000 gallons of ice cream a year.

To service a large part of eastern Wisconsin, some parts of far northern Wisconsin and the Upper Michigan Peninsula, the plant draws its raw milk from some 500 farms around Milwaukee. Some milk and cream for ice cream production are delivered from Borden's Galloway-West Co. plant in Fond du Lac.

Two older plants in downtown Milwaukee are replaced by the new single-story structure which has 110,000 sq ft of floor area. For loading, there is a 300-ft long refrigerated dock with doors at 20-ft intervals. An article covering this feature of the plant has been scheduled for future issue of FOOD PROCESSING.

Other features of this plant which will be covered in future issues include an automatic ice cream mixing system and a streamlined materials handling system.

Borden's new Milwaukee plant is a showcase of the very latest in processing equipment; it is also an example of how far automatic control of dairy processing has progressed toward complete automation.

The plant is the result of modern management philosophy which, as expressed by W. E. Shiffermiller, Assistant General Manager, states: "If you are building in 1960, you should put everything into the plant that is available and reasonably proven in 1960, provided of course, that it will help your operation.

To control production, both from qualitative and quantitative standpoint, one man has regulation of virtually all processing operations — from pumping out raw-milk weigh tanks to pumping into filling machine bowls — at his fingertips.

To sanitize lines and equipment, four independent automatic CIP systems, each separately controlled, are connected to all departments.

About 125,000 gallons of fluids, unequally distributed in volume among over half a dozen products, are processed daily.

Add to this the necessity of filling these products in glass, paper and metal containers of ½ pt, pt, qt, ½ gal, gal, 5-gal and 10-gal size and you get an idea of the operation at Borden's Milwaukee Region plant.

Process control

For purpose of control, fluids department is divided into two divisions, each with its own control panel.

First panel has controls for channeling fluid flow from either of two raw-product weighing tanks into any of seven raw-product storage tanks.

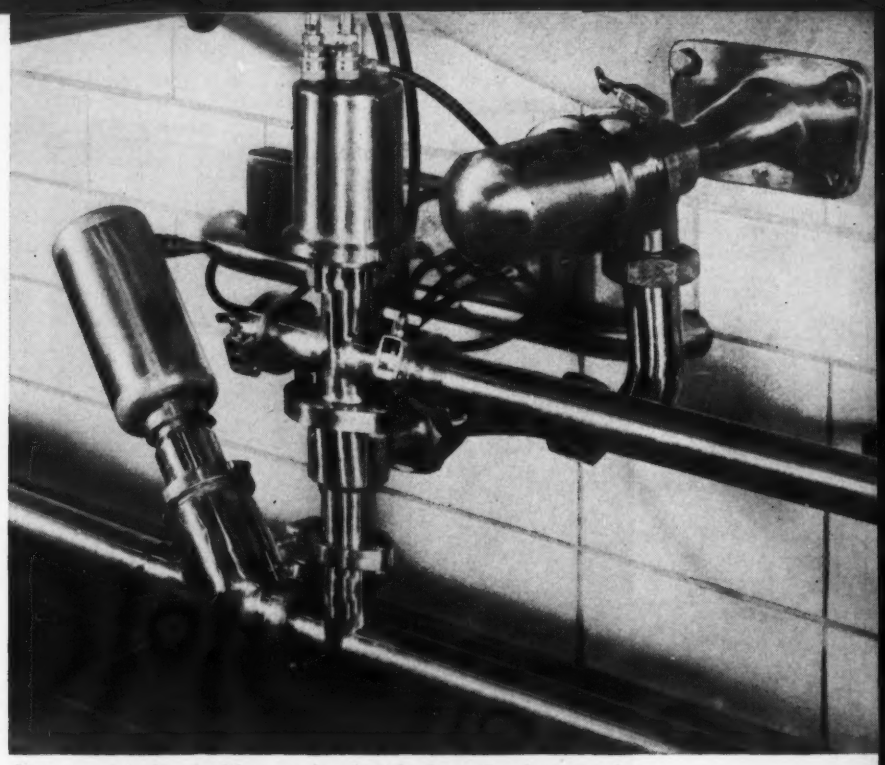
Flow is controlled from panel through any of the processing steps — separation, clarification, pasteurization (175 F for 16 sec) and homogenization. There are also controls on panel for switching flow from processing operations into any of seven pasteurized-product storage tanks.

In addition, one of four automatic CIP control stations is incorporated into panel, see photos page 38.

Second control panel is utilized by operator for switching flow from any of seven pasteurized-product storage

ex Operation

FRANK L. BONEM
Associate Editor



Short pneumatic lines lead from nearby solenoid valve to flow diversion valves

tanks to any of seven fillers. In addition, panel has controls for directing flow of byproducts, such as buttermilk or orange juice, from any of eight byproduct storage tanks to fillers.

Panels are strategically located within approximately 30 ft of each other. First control panel is mounted in wall at head of row of pasteurized-milk storage tanks, across from two sets of pasteurizers and homogenizers. Second panel is located across aisle from same storage tanks in front of filling area.

Next to first control panel is battery of 14 liquid level gauges which indicate content in pounds of all raw and pasteurized product storage tanks.

Thus one man can manipulate both control boards as well as keep an eye on pasteurization and homogenization, clarification and separation, receiving and filling.

Control panels, which are essentially switching stations for remote-controlled flow diversion valves, have dial switches for dialing desired tank or line. There are also start and stop buttons for activating valving system and for starting or stopping pumps.

In addition, panels have visual indicators on top which show source and destination of fluids in motion. In order that contamination of product by cleaning fluids cannot take place at any time, panels are interlocked with CIP control panels. Also, visual indicators will show when a tank or machine is being cleaned.

On first control panel there are 10 dial switches. On nine of these any of the seven raw product tanks can be dialed. Through these switches, valves automatically set up line circuits for any of the following functions:

1. Supply No. 1 pasteurizer
2. Supply No. 2 pasteurizer
3. Discharge from No.1 past
4. Discharge from No. 2 past
5. Fill tank
6. Transfer to
7. Transfer from
8. Standardize
9. Separate
10. Clean

At top right of panel, indicator flashes over the particular raw tank number the terminal point of the raw product being pumped from that tank.

Panel at top, left, flashes over the number of the pasteurized-product tank the specific piece of equipment from which flow is coming into tank.

Thus, if milk is being drawn out of No. 4 raw-product tank and is being pumped to No. 1 pasteurizer, and from there pumped to No. 6 pasteurized holding tank, "No. 1 pasteurizer" will flash above No. 4 on right panel and above No. 6 on left panel.

Similarly, if No. 2 raw tank is being filled and No. 3 pasteurized tank is being cleaned, "Fill" will flash over No. 2 on the right panel and "Clean" will flash over No. 3 on the left panel.

Second control panel has 14 dial switches: seven to switch from desired finished product or byproduct tank to desired feed line, top row, and seven to switch from feed line to desired filler, bottom row, see photos page 39.

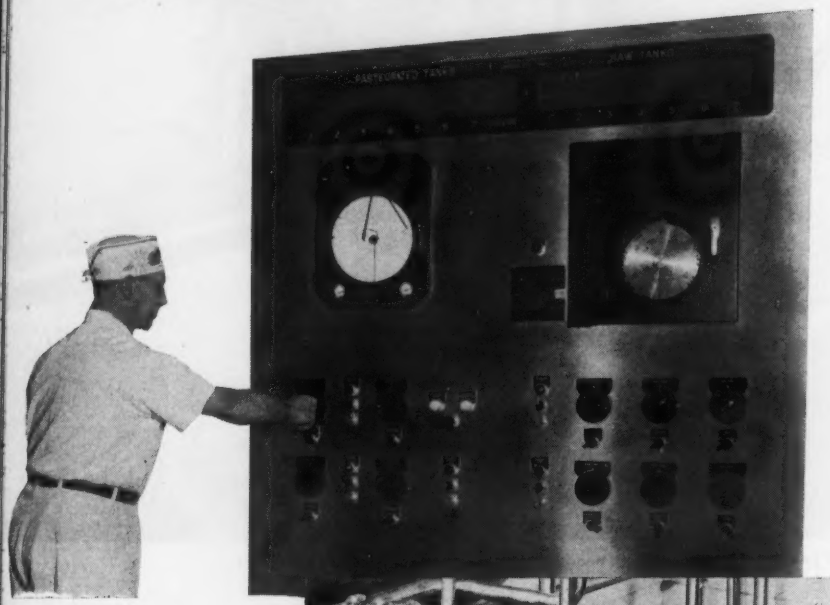
Visual indicators on this panel are mounted one above the other. Bottom indicator has line numbers marked and flashes tank number to which line is connected and from which flow is coming. Top indicator has filler numbers marked and flashes line number which is feeding filler.

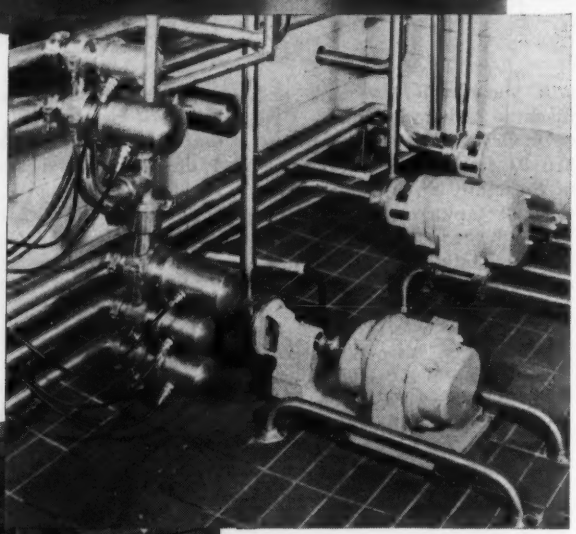
For example, if milk is being pumped out of No. 3 tank through No. 5 line to No. 1 filler, the number "3" will flash on bottom indicator above line No. 5 and the number "5" will flash on top indicator

Over-all design of control and CIP systems was carried out by Klenzade Products, Inc., Beloit, Wis.
7724 on Reader Service Slip.

Fesco Division of Ladish Co., 228 James St., Barrington, Ill., was responsible for detail engineering of job. Firm designed and furnished the process control panels as well as all flow-control valves and their manifolds.
7725 on Reader Service Slip.

Valve Pulsing Control Panel as well as Flex-O-Timer timed program controller are products of Taylor Instrument Companies, 95 Ames St., Rochester 1, N.Y.
7726 on Reader Service Slip.





All remote-controlled valves, utilized in channeling flow of raw product through any of the process operations, are automatically set through dials on this control panel. Below visual indicators are timing dial, right, and temperature recorder controller, left, for one of plant's automatic CIP systems.

Three pumps at end of raw product headers handle all fluid functions. From left to right, they are used for transferring or feeding separators, feeding No. 2 pasteurizer and feeding No. 1 pasteurizer. Note special mounting of pumps, welded lines and welded valve manifold

Flow of raw product into and out of tanks is channeled through five pipelines which are used as follows (from top to bottom): transfer to tanks or standardize; fill from weigh tanks; to No. 1 pasteurizer — 50,000 lb/hr; to No. 2 pasteurizer — 20,000 lb/hr; transfer from tanks or pump to separators.

above filler No. 1.

Panel also has two small indicators one of which shows what tank is being cleaned. Second small indicator flashes number of the tank that is being filled from either No. 1 or No. 2 pasteurizer.

For a more orderly, compact installation of pipes, valves and control lines, valve headers are shop fabricated and pipes are arranged in two main groups.

For handling raw product, one series of five lines is installed immediately in front of raw product tanks. For handling finished product to filler area, group of seven lines is installed overhead, parallel to filler area and row of finished product tanks, see photos right.

All pipe lines were welded in the field, a significant departure from previous installation methods for sanitary SS piping. Method achieves smoother joints which offer less chance for bacterial growth.

Since welded lines are rigid and permanent, motor and pump units are mounted on special SS runners, see photo at left. For servicing, motor after being disconnected, slides back from pump head on runners.

The numerous flow diversion valves throughout plant are air-operated. To eliminate many pneumatic lines of great length, electric solenoid valves are located close to each cluster of flow valves. Short lengths of air hose connect solenoid valve to flow valves.

Thus relatively few lines of electric conduit are necessary to carry control signals to many flow valves.

4 CIP systems

Four independent, automatic CIP systems, three for milk and one for ice cream processing, cover practically all equipment and piping in plant.

System A is laid out to clean all pasteurized-milk tanks, eight byproduct tanks, all pasteurized-product lines, two HTST pasteurizers and the skim milk line leading to the cottage cheese department.

Control panel for system A is incorporated into first process control panel. Make-up tank, metering and circulating pumps for system are located in the tiled enclosure which houses the pasteurized-product tanks.

Built into wall of tiled tank enclosure, at appropriate locations, are three Cleaning Hook-Up Stations for diverting flow of cleaning solutions to the many tanks.

A fourth station, located next to the tank-level gauges, provides additional flexibility since through this station, either of the two HTST pasteurizers can be cleaned

with either system A or B.

System B is used for cleaning all raw-milk lines and all raw-milk storage tanks. Control panel is mounted on tile enclosure of tanks. Inside enclosure are pumps and tanks of the system.

Three Cleaning Hook-Up Stations are utilized in system to divert flow to different tanks.

System C is designed to clean equipment and lines in the ice cream departments. Specifically, it covers eight ice cream mix storage tanks and 10 Univats.

System also covers cream unloading facilities — three tanks, their lines and pumps. In addition, it covers ice cream mixing facilities — four storage tanks, one weighing tank, pasteurizer and homogenizer.

Only one Cleaning Hook-Up Station is used, and that on storage and mixing tanks. On ingredient tanks, leak protected plug valves are used.

System D is for cleaning receiving-weighing tanks, their lines and pumps. It is also used to clean all tankers bringing in milk. Control panel, tank and pumps for system are located in receiving area.

Better valve cleaning

All four automatic CIP control panels have temperature recorder-controllers for governing temperature of circulating solutions and rinses, timed program controllers for governing sequence and length of various cleaning functions and cycle selector switches.

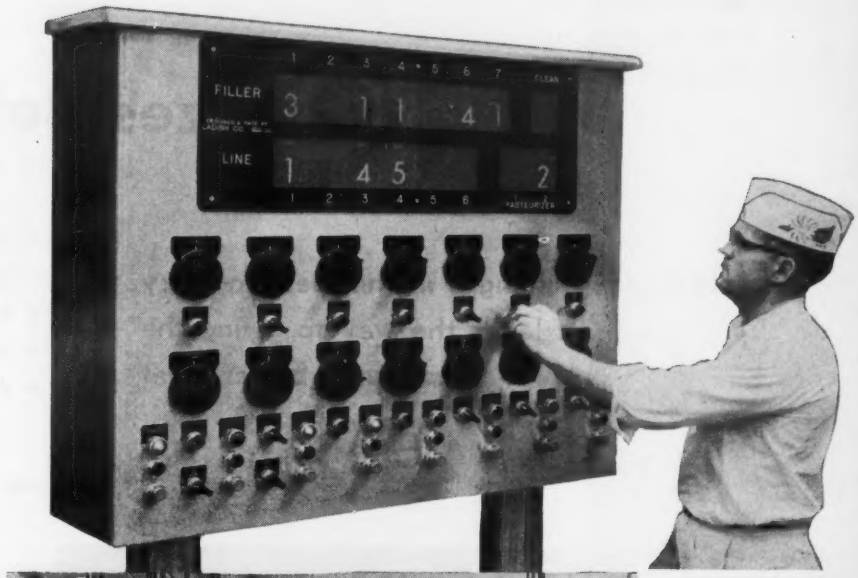
In addition, all panels have a Valve Pulsing Control Panel mounted at rear, inside the cover. Function of this panel is to cause process flow control valves to pulsate while cleaning solution is flowing through lines. That is, valves move up and down in order that they and their stems will also be cleaned thoroughly.

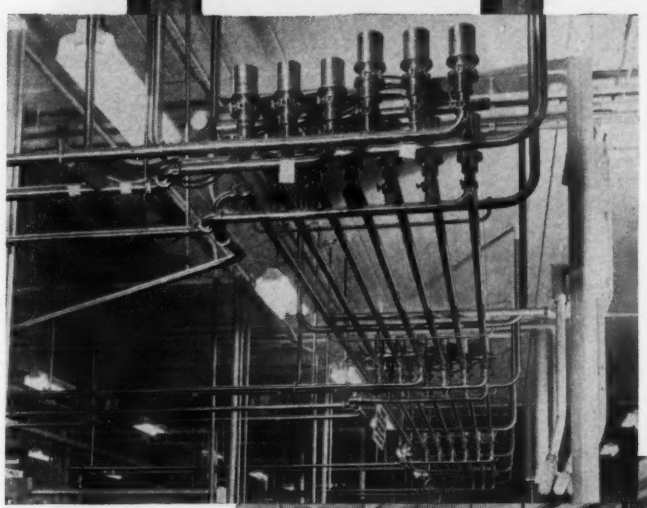
Valves pulsate through every step of cleaning cycle at frequency of either 15 or 60 seconds. For rinses, which are of relatively short duration, valves change position every 15 seconds; for cleaning solutions, which circulate for relatively long periods, valves change positions every 60 seconds.

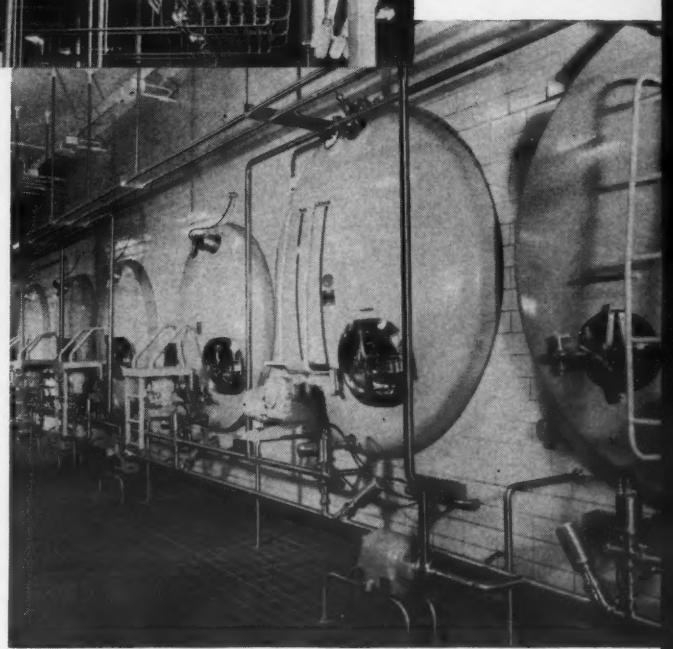
Valve pulsations are triggered by timing dial of timed program controller. Timer also selects appropriate pulse rate for step of cycle that is in progress.

In cases where cleaning circuit comprises lines with product valves as well as tanks, an external selector switch automatically keys in pulsing panel, but only during line cleaning.

For further details on operation of timer and other equipment in automatic CIP systems, see June FOOD PROCESSING, page 36. END







Through control panel No. 2, finished product is pumped from any of seven pasteurized product tanks through any of six headers to any of seven fillers. Seventh line in overhead group is utilized for byproducts. Special valve manifolds in overhead lines switch flow.

Panel has eight start and stop buttons for eight pumps. Six pumps are used for feeding pasteurized product to filling machines; two pumps are used for feeding byproducts

Swift Tenderizes Beef on The Hoof

Foreshadows changes in the meat industry as Swift leads the way to giving the consumer better meat

- **Reduce cattle time in feed lots**
- **Emphasize higher percentage of lean beef**
- **Revise grading standards**
- **Reduce inventory of aging beef**
- **Prepackage meats in the plant**

JOE VOORHEES, Associate Editor

"Totally tenderized" may soon become the term Swift will apply to its beef processed under the new tenderizing method

Swift & Company has made tenderizing beef on the hoof a fact. They are now injecting a liquid enzyme tenderizer into nearly 1000 head of cattle a week at packing plants in Ocala, Fla. and St. Joseph, Mo.

The method of tenderizing calls for the injection of about a cupful of a liquid enzyme tenderizer into the circulatory system of cattle approximately ten minutes before slaughter.

Tenderizing action, however, is not started until the enzyme is activated by the heat of cooking. All of the meat of the animal is affected since the enzyme spreads throughout the beef animals' circulatory system rapidly, being retained in even the smallest blood vessels.

Tradenamed ProTen, beef is tenderized by a specially processed form of papain, a protein-affecting enzyme derived from the papaya plant.

The process has been patented by Swift. Approval of this new development has been received from the USDA under the Meat Inspection Act. It does not affect the flavor of the beef in any way and, in addition to tenderizing, avoids the shrinkage losses and discoloration associated with aging methods.

Tests on beef from livestock tenderized by the new method have shown that less expensive cuts can be sliced and grilled satisfactorily as steaks.

While all grades of beef can be tenderized by the new process, Swift will use the trademark ProTen only on its top grades at present.

In addition to the two packing plants at Ocala, Fla. and St. Joseph, Mo., previously mentioned as using the new tenderizing method, it is expected that several other plants can be put into operation this year processing Pro-Ten beef.

Marketing tests, which have been conducted for two years in parts of the South and Midwest, will be extended as soon as additional facilities become available. It will be some time, however, before the beef is available nationally.

The process can also be applied to other animals. Successful results have already been achieved on veal and mutton. However, the need to tenderize beef is greater than for other meat animals.

While no additional information is available on the new beef tenderizing process at this time, FOOD PROCESSING will report further developments as they are revealed in the future.

Foreshadowed Changes

What are some of the foreshadowed changes that may come about in the meat industry as a result of this technological development for tenderizing beef?

continued on page 43

OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for illustrated Brochure "The Olin Carton Service"

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OTHER OLIN PACKAGING PRODUCTS: CONTAINERS, BAGS, CELLOPHANE, POLYETHELENE, FINE PAPER
Write for illustrated Brochure "The Olin Carton Service"

It takes more than paperboard to make

OLIN CARTONS

resources • basic research • modern equipment • printing skills • package design quality control • • dedication . . .

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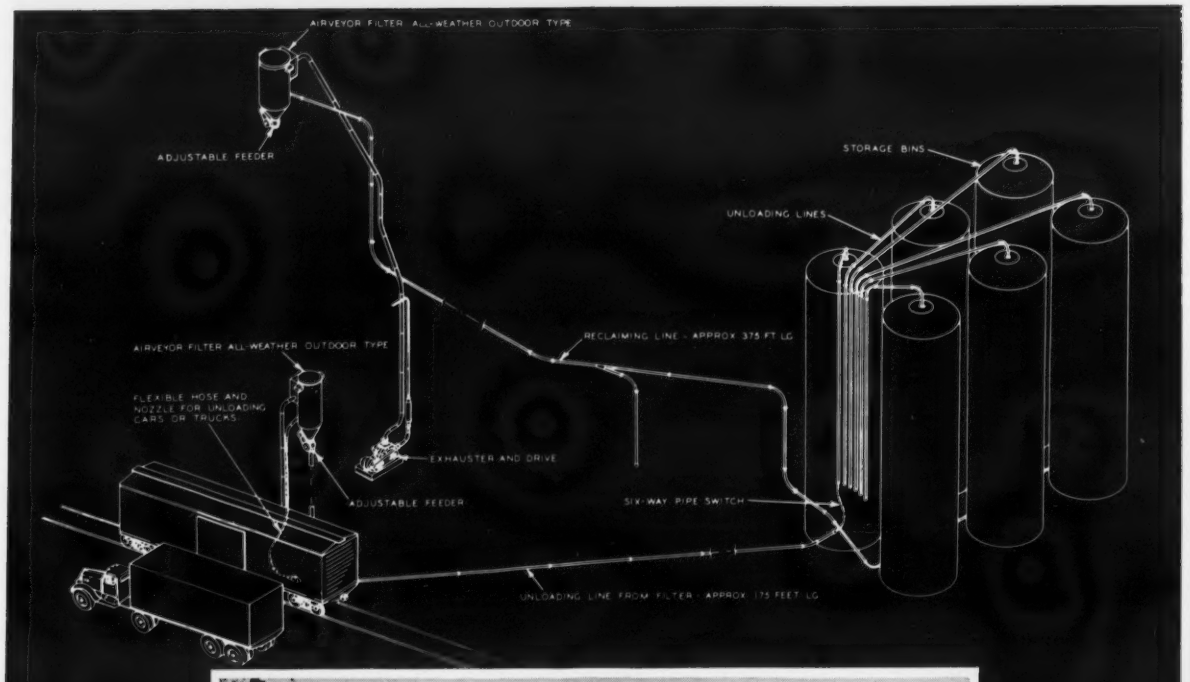
P. O. Box 488, West Monroe, Louisiana


AIRVEYOR FILTER, ALL-WEATHER OUTDOOR TYPE
ADJUSTABLE FEEDER
STORAGE BINS
UNLOADING LINES
RECLAIMING LINE - APPROX. 375 FT. LG.
AIRVEYOR FILTER, ALL-WEATHER OUTDOOR TYPE
FLEXIBLE HOSE AND NOZZLE FOR UNLOADING CARS OR TRUCKS
EXHAUSTER AND DRIVE
ADJUSTABLE FEEDER
SIX-WAY PIPE SWITCH
UNLOADING LINE FROM FILTER - APPROX. 175 FEET LG.

The arithmetic of materials handling

One man + one mill + Fuller pneumatic conveying = work of four mills

How did F. M. Brown's Sons, Inc., double production at one of their Pennsylvania mills without plant expansion? They needed increased storage area to meet new capacity requirements. What was the solution? Two Fuller Airveyor® pneumatic conveying systems were installed in their Birdsboro mill. One for rail car and truck unloading and the second system for reclaiming from storage to process.

Results—with this new equipment, one mill produces enough feed to allow Brown to use the other three mills for storage and distribution. Production is still increasing and handling costs have been cut up to $3.00 a ton.

In addition to increasing storage space, and reducing unloading time and costs, these systems are self-cleaning, thus minimizing contamination.

If you are now handling dry, bulk, granular materials, it will pay you to look into Fuller pneumatic conveying systems. Fuller systems are engineered specifically for your particular application. They bend around corners, run up or down, through walls and floors, almost any distance—even underground. Write or phone today outlining your problem. Fuller will gladly furnish additional information with appropriate recommendations.

1188
A267

FULLER COMPANY GENERAL AMERICAN TRADE MARK

FULLER COMPANY
176 Bridge St., Catasauqua, Pa.
Subsidiary of General American Transportation Corporation
Offices in Principal Cities Throughout the World

Fuller
...pioneers in harnessing AIR

7728 on Reader Service Slip.

continued from page 40

Feed lots. Because the new process assures tenderization throughout the beef animal, it will be possible to hold livestock in the feed lot for shorter periods than at present.

Pre-slaughter fattening assumes less importance as packers will place more emphasis on animals producing a high percentage of lean beef.

Revised grading. It may be that revised standards of grading beef will come about as a result of the new tenderizing method.

The present grading system is based primarily on the old English system of quality judged by the degree of fatness and its proper distribution throughout the meat. Tenderness is measured, in part, by this grading system.

Such grading standards would, however, be outmoded since every part of the animal is tenderized when the liquid enzyme is injected into the livestock.

Smaller inventories. With less time required for tenderizing beef by the new method, the cost of carrying large inventories of aging beef can be reduced considerably.

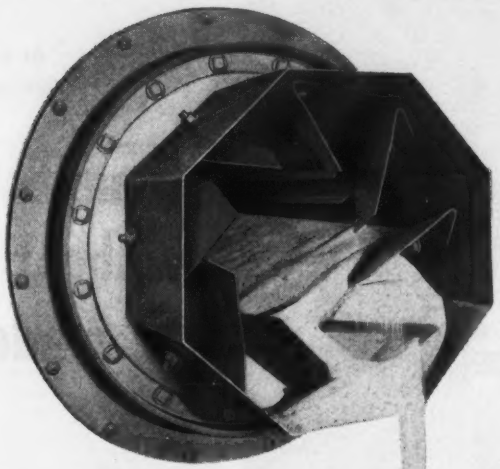
Prepackaging. Increased standardization between various cuts of beef, made possible by the tenderizing method, will very likely lead to prepackaging of meat at the plant.

Consumer acceptance. Consumer acceptance for the pre-tenderized beef should be quite high. Consumers will be attracted to less expensive cuts of meat which, through the new tenderizing process, can be made as tender as the top cuts. Thus, better meat will be made available to the consumer. END

SEE THE CLASSIFIED SECTION

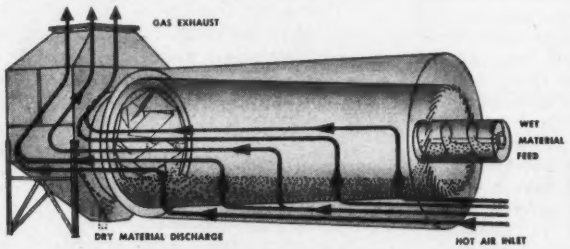
Equipment — Materials — Employment — Business Opportunities—Professional and Technical Services
Page 121

Specify a LINK-BELT Roto-Louvre



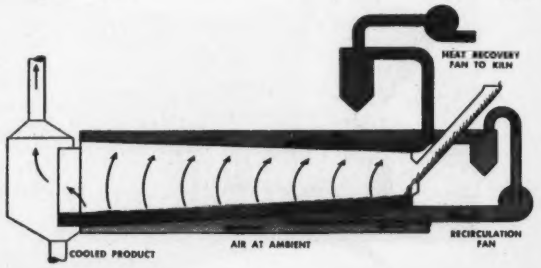
for uniform drying

ROTO-LOUVRE DRYERS provide precise processing for heat-sensitive, friable and hygroscopic materials. Compact and highly effective, the Roto-Louvre introduces dry, heated air through ever-changing channels . . . exposing the entire surface of every particle to uniform treatment. NO OVERHEATING — Large volume of hot, dry air easily penetrates thin bed at feed end for maximum heat transfer where greatest evaporation can take place. At discharge end, smaller air passages permit less heated air to penetrate bed. NO BREAKAGE — Material rolls gently over itself in a spiral path to the discharge end, minimizing abrasive effects and degradation.



for uniform cooling

ROTO-LOUVRE COOLERS use air at ambient temperature or air at reduced temperature from a cooling unit. *No other cooler can turn out a more uniformly cooled product!* And because material rolls gently over itself, no degradation occurs from lifting and cascading. This same gentle rolling action also prevents abrasion to the louvres. The Roto-Louvre excels where heat can be used for subsequent processing. Two types of recirculation arrangements are available, depending on desired extent of heat recovery. With the superheat recovery system (below), air can be passed over material a *second* time . . . permitting heat recoveries up to 60%. 15,410



You can lower your per-ton drying and cooling costs with consistent uniformity of end product when you rely on the efficiencies of Link-Belt Roto-Louvre. And, valuable floor space can be saved since Roto-Louvre occupies up to 50% less space than other types of units of similar capacities.

LABORATORY PRETESTING SERVICE! We'll be glad to laboratory-test a sample of your material and work out drying or cooling procedures you can duplicate in your plant. For complete details and Roto-Louvre Book 2511, contact your nearest Link-Belt office.

LINK-BELT

DRYERS · COOLERS · ROASTERS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Warehouses and District Sales Offices in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

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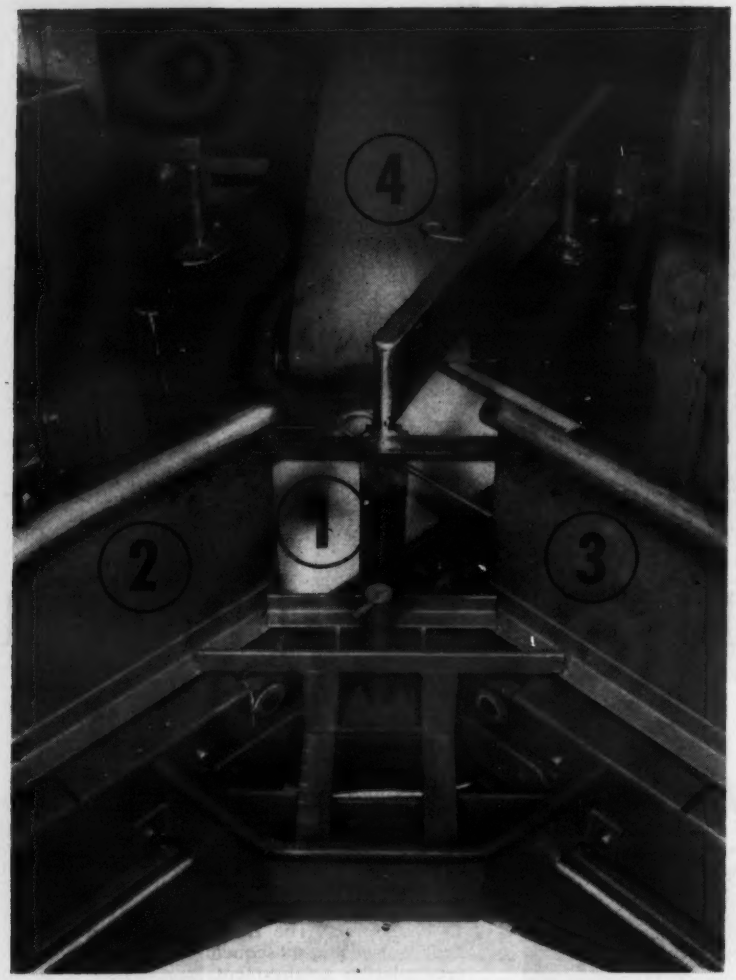


At one of nation's largest millers, high-speed semi-automatic system . . .

Doubles flour-packing output without increasing manpower or decreasing accuracy

NORB LEINEN
Associate Editor

PROBLEM: For many years, one of nation's largest flour-milling firms had packed six to eight 100-lb bags per min with a two-man operation (one man packing, the other sewing).

System employed consisted of: 1) a triple-screw-type feeder which delivered material from storage to 2) an automatic net weighing scale which discharged a preset weight of flour on impulse from 3) an auger packer which packed and then discharged the bag on 4) a bag-sewing and conveyor unit.

Company wanted to double its flour-packing output to meet increased sales demand and to increase packing efficiency without 1) an increase in labor cost, and 2) an increase in weight give-away per bag.

(Some weight give-away is set into the bagging scale to insure compliance with weights and measures regulations and to maintain customer goodwill. However, with high-speed bagging, tolerance for such "losses" becomes critical.)

Solution: Company installed an ingenious system consisting of two "GGG-38" Automatic Flour Scales in a duplex combination, two "G-23" auger packers and a Y-type arrangement (see drawing) of four flat-belt bag conveyors — all equipment being designed, engineered and manufactured by Richardson Scale Co., Van Houten Ave., Clifton, N.J.

In operation, preset weight of flour is discharged from each scale's weigh hopper by a solenoid mechanism controlled by the packer below.

Timing sequence for packing operation enables one man to handle output from the duplex combination.

Packer, beneath the scale, features an auger inside an eight-in.-diam tube. On this tube an air-operated motor drives the auger, packing flour by forcing it screw-wise into the bag, while bag and bag holder slide down the auger tube against packing pressure.

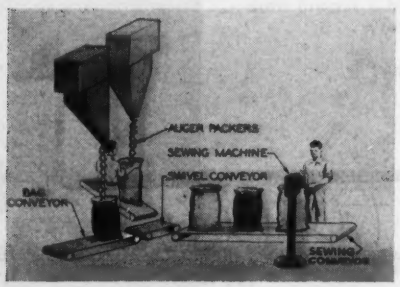
Among the problems not apparent in a single-packer operation that had to be resolved here was this example.

With a two-man, single-packer operation at eight bags per min, operator had ample time to assist in properly positioning the bag on the conveyor.

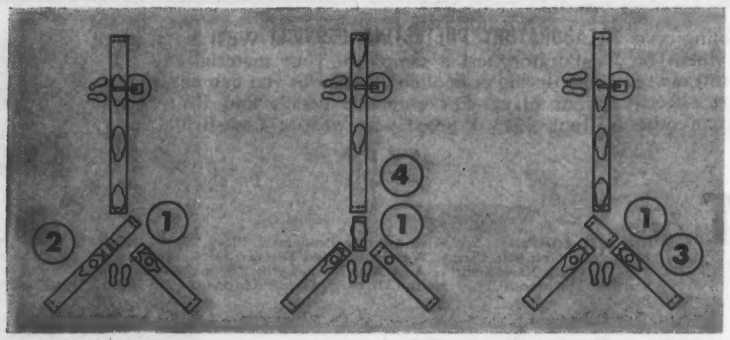
However, with an increase in speed to 16 bags per min, he had absolutely no time for any movements other than placing the bags on the spouts of the packers.

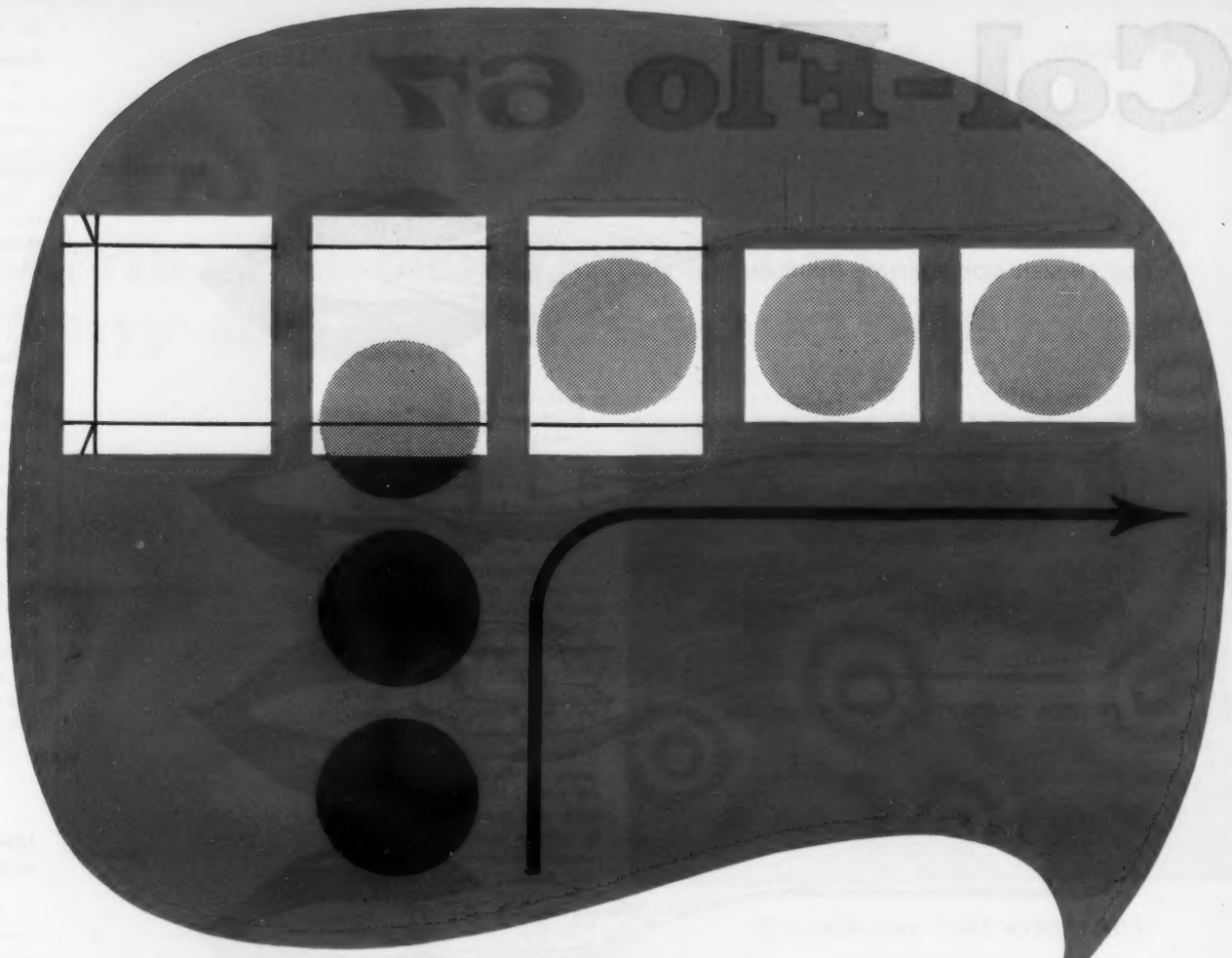
This required complete automatic control of the bag once it was placed on packer's bagging spout.

Standard feature of the Richardson "G-23" auger packer is automatic release of the bags after packing. Baffles and guides are provided as part of the conveyor arrangement so that bags drop from auger and onto the conveyor without any assistance from



Heart of high-speed flour-packing system is swivel conveyor (1) which automatically acts to channel two bagging lines (2) and (3) into a single sewing line (4). To do this it shifts through three positions: in-line to receive filled bags from bag conveyor (2); in-line with sewing conveyor (4) to discharge filled bag; in-line with second bag conveyor (3)





KEY TO MASS MARKETS: PACKAGING SYSTEMS . . . The big new world of mass merchandising and mass selling depends on high ratios of production to meet volume demand. This calls for packages which can be automatically set up, formed, filled and closed at high speeds. CCA cartons, **plus** high-speed machines developed through CCA's Machinery Development Department, are helping manufacturers meet mass market demands. To **pack it—move it—sell it** is the business of CCA packaging.

CONTAINER CORPORATION OF AMERICA
Chicago 3 . . . and all key marketing areas

CCA

Folding Cartons, Shipping Containers, Sefton Fibre Cans, Molded Plastic Products, Point-of-Purchase Displays, Paperboard

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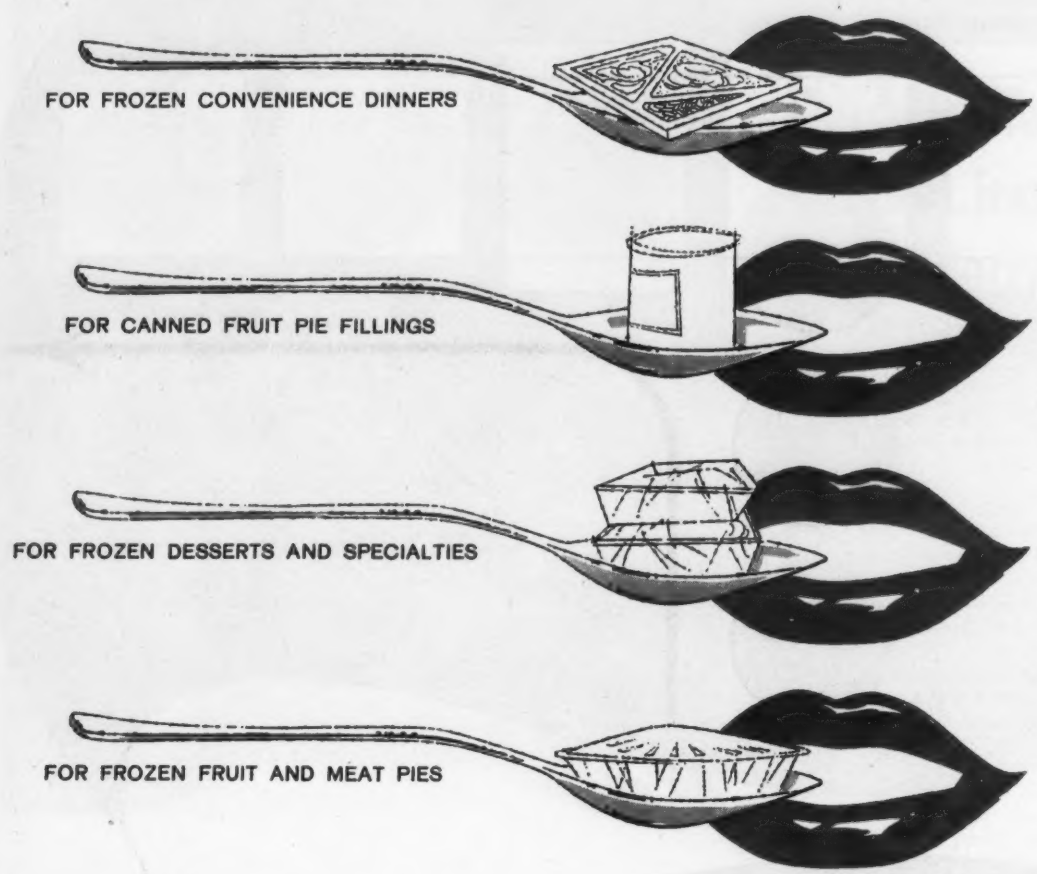
Col-Flo 67


FOR FROZEN CONVENIENCE DINNERS
FOR CANNED FRUIT PIE FILLINGS
FOR FROZEN DESSERTS AND SPECIALTIES
FOR FROZEN FRUIT AND MEAT PIES

NEW STANDARD IN STABILIZERS

COL-FLO 67—canned or frozen—never imparts an undertone of cereal taste. Never interferes with natural food flavors.

UNMATCHED STABILITY. Col-Flo 67 safeguards and improves stability. All tests show far greater resistance to freeze-thaw breakdown than wheat flour or other waxy starches.

EXCELLENT CLARITY. Col-Flo 67 doesn't cloud natural colors between processing and eating. An appealing crystal clear glossiness highlights your food product.

A simple taste comparison quickly emphasizes the advantages of tasteless Col-Flo 67. Write for details, telling us something of the use you have in mind.

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the operator.

Actual heart of system is a Y-type "swivel-conveyor" (see close-up) which acts automatically to channel two bagging lines into a single sewing line.

To do this, it shifts through three positions: 1) in-line to receive filled bags from first bag conveyor, 2) in-line with sewing conveyor to discharge filled bag, 3) in-line with second bag conveyor.

Results: Company officials report that two men with the new system can produce as much as four men with the conventional system of individual packers and sewing stations.

This high speed of operation is achieved with no sacrifice in accuracy — all bags being well within the required two-to-three-oz give-away tolerance.

In addition, handling of bags is simplified, since all sewn bags are automatically delivered to one point.

7732 on Reader Service Slip.

Insure your product with quality control

"Quality Control and Research", a 24-page booklet telling how and why a manufacturer can insure his products in today's highly competitive market, is now available from Scientific Apparatus Makers Association.

Booklet is aimed particularly at the small business man, but executives of multi-division plants will also find it a practical management tool in producing a lower-cost but better-quality product.

Illustrated booklet contains information on what quality control is, and how to get the most out of it as well as statistics on research expenditures and rate of return and growth in research expenditures.

7733 on Reader Service Slip.

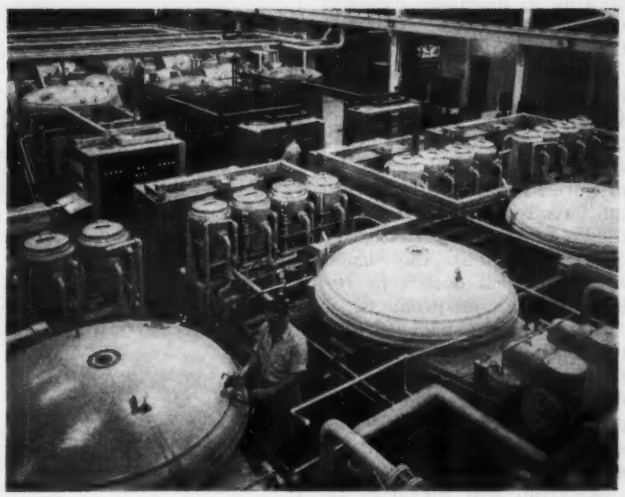
HELP YOURSELF....
For a quick reference to new technical literature available this month, see the classified listing on page 117.

Exploratory research indicates practical way to . . .

Eliminate pasty quality of many starch based foods

- Macaroni
- Spaghetti
- Noodles
- Cooked cereals
- Gravies for prepared foods

DR. GEORGE Y. BROKAW
LOUIS J. LEE
GERALD D. NEU
Distillation Development Laboratory
Distillation Products Industries



High-purity monoglycerides are produced in high vacuum molecular stills shown in photo at right. Monoglycerides, suggested for use in eliminating pastiness in starch based foods, are generally recognized as safe for use in foods, having been officially so classified by FDA. Therefore, they do not come under the food additive regulations. (See "White List" published in FOOD PROCESSING, January, 1960, page 65.) They are manufactured from the glycerolysis of edible grades of vegetable or animal fat sources 7879 on Reader Service Slip.

THE successful utilization of high purity monoglycerides to eliminate pastiness in instant dehydrated potato flakes has led to exploratory research by Distillation Products Industries, Rochester, N.Y., with other starch based foods.

Experiments to date indicate that monoglycerides will eliminate the characteristic pastiness, sticking and gluey consistency experienced when cooking macaroni, spaghetti, noodles and cooked cereals.

Effects are realized only with monoglycerides and not with diglycerides or triglycerides.

Macaroni products, including spaghetti and noodles, have always presented the problem of becoming pasty when cooked. The pastiness is caused primarily by starch molecules (amylose) liberated in the cooking. While rinsing in cool water after cooking washes away some of the soluble amylose, the spaghetti and macaroni still lumps together after standing for a short time.

Similarly, it has been recognized that cooked cereals have a tendency to be pasty and the texture deteriorates under prolonged heating when soluble amylose is released.

Adding monoglycerides to these products complexes the free soluble amylose, preventing the amylose molecules from forming a gelatinous mass.

The Eastern Regional Research and Development Laboratory of the U.S. Department of Agriculture has worked out a simple way to determine when enough monoglycerides have been added to mashed potatoes, in the instant dehydrated potato flake process, to complex all the free amylose.

They have found that since the starch-monoglyceride complex does not turn blue in the presence of iodine, an iodine titration can be used to determine effectiveness in potatoes.

The effect illustrates that the complex is a chemical or physico-chemical entity which has different chemical properties as well as different physical properties from the original starch. The primary physical difference is the reduction of starch gelation, primarily of the amylose portion, in the water-containing food; thus reducing stickiness and pastiness.

Incorporating monoglycerides. Monoglycerides, which are moderately soluble in water, present a problem when being incorporated into various products.

They have a peculiar property of gelling at temperatures of 160 to 165 F. The addition of certain other ingredients will lower their gelling point.

The gelling problem varies with the specific monoglycerides used, the hardness of the water and the other ingredients.

In the dehydrated potato flake process, monoglycerides were incorporated into an emulsion of water, Tenox IV (an antioxidant) and nonfat dry milk.

In this case, the antioxidant Tenox IV lowered the gelling point to about 140F. To overcome the problem of gelling, the monoglycerides are dispersed in water heated to about 150F. The water is then allowed to cool a few degrees below 140F. before adding the Tenox. Order of incorporation of ingredients and control of temperature prevented the solution from gelling.

Macaroni, spaghetti, noodles. Preliminary laboratory experiments indicated that monoglycerides could be successfully incorporated into macaroni products, including spaghetti and noodles.

Therefore, a run of spaghetti was made in an actual processing plant. A monoglyceride and water dispersion was processed with #1 semolina wheat in a production-type spaghetti extruder and dried by normal procedure.

The resulting product, which

contained approximately 0.8% monoglycerides, was then cooked for 12 minutes, and with no cold water rinse, still was non-pasty.

After cooking for 28 minutes, it was noted that the spaghetti did not have the customary pasty quality or softness and remained separated after standing for some time.

The use of monoglycerides to eliminate pastiness and sticking in macaroni products offers an obvious advantage for consumer use.

Such a product would also have wide application for institutional use where large quantities of macaroni, spaghetti or noodles could be prepared in advance and held until ready to be served. And they could be reheated after cooking without the usual sticking which occurs in reheating macaroni products.

Since frozen spaghetti and macaroni tend to be sticky and lumpy when prepared for eating, they too could be improved by complexing the free soluble amylose with monoglycerides.

Macaroni and spaghetti for canned products are precooked in an excess of water which is time consuming and expensive. Cans are then filled with the product and heated for about an hour at approximately 200F. This overcooking softens the macaroni and spaghetti and results in a solid mass in the can that settles and sticks together.

It appears that 0.8% monoglycerides would be the maximum required to improve the product by preventing this sticking.

Monoglycerides also offer a possible advantage through the use of less costly ingredients in the manufacture of macaroni products. The most expensive wheat product being used in their manufacture now is #1 semolina. Semolina produces a less pasty cooked product (even though a problem still exists) than a blend of semolina and less expensive farina.

Apparently the amylose content of farina is higher than semolina. If this is true, the use of monoglycerides could produce a non-pasty cooked

FOR PROGRESS IN FOOD TECHNOLOGY THROUGH RESEARC

INSTITUTE OF FOOD TECHNOLOGISTS 196 ACHI
presented to MERCK CHEMICAL DIVISION AMEI

I.F.T. ACHIEVEMENT AWARD. This year's Institute of Food Technologists Achievement Award goes jointly to Merck and the American Meat Institute Foundation for research and development resulting in a new, more efficient way to process semi-dry sausage products. The new process, based on controlled fermentation, sharply reduces processing time and product failures through the use of Accel, the starter culture developed by the AMIF and made commercially available by Merck.

AN EXAMPLE OF MERCK TECHNICAL CAPABILITIES. The I.F.T. Award is one more example that Merck has the technical facilities, know-how and desire to serve the food industry as a whole as well as individual processors. Other examples of Merck technical achievements in the food field include the development of processing ingredients that improve production efficiency, eye appeal, shelf life, taste and nutritional value of many different foods.

MERCK FOOD RESEARCH LABORATORIES. Merck research and technical service facilities are centered in the Food Laboratories in Rahway, New Jersey. Here is where research on new food processing ingredients is conducted and where technical problems of Merck customers are met. The facilities include a microbiology laboratory, a chemical laboratory, an applications labo-

ratory fo
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AT YOUR S
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product, using farina, which should be at least as favorable as those already obtained with semolina.

Thus, monoglycerides may upgrade those starches where amylose is a problem, eliminating the strict requirements for using only special wheat products. This would make the manufacturers of these alimentary products less dependent upon the quality of the grain available.

Cooked cereals. Work on oatmeal and rice is still in the experimental stage, although it has been shown that the addition of monoglycerides to cooked cereals can prevent them from gluing together in one solid mass.

Experiments have been made adding monoglycerides to both instant and regular oatmeal.

The monoglycerides had a different gross effect upon the instant product. The fine particle size of instant oatmeal resulted in a thin slurry when reconstituted with monoglycerides.

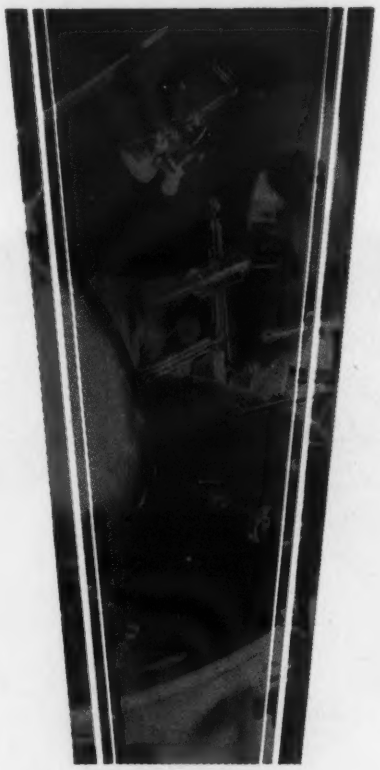
Adding 1.0% monoglycerides to regular oatmeal, however, showed a definite improvement in texture, dryness and elimination of pastiness. Improvement was still evidenced after holding the oatmeal warm for three hours.

Increasing the amount of monoglycerides in the regular oatmeal showed still further improvement in texture and elimination of pastiness.

Even more striking improvement has been obtained with cooked farina cereal.

Gravies for prepared foods. Gravies thickened with flour become increasingly thicker upon standing for any length of time. However, with monoglycerides added, they would retain the same consistency until ready to be reheated for use.

7735 on Reader Service Slip.



ACHIEVEMENT AWARD
AMERICAN MEAT INSTITUTE FOUNDATION

ratory for testing the performance of products made with Merck ingredients, a modern testing kitchen, and a taste panel laboratory.

AT YOUR SERVICE. Do you have technical problems relating to processing or product development? Merck food specialists are always interested in challenging problems. Perhaps they already have the answer to yours —or can help you find it soon. A word to your Merck representative will start the ball rolling.

Merck Products for the Food Industry

Accel® (*lactic acid starter culture*) • Monosodium glutamate • Neo-Cebicure® (*erythorbic acid*) • Neo-Cebitate® (*sodium erythorbate*) • Sorbitol • Vitamins and amino acids • Citric acid.

MERCK

MERCK CHEMICAL DIVISION

MERCK & CO., INC. • RAHWAY, NEW JERSEY

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HELP! HELP!

There's a storehouse of information offered in technical literature. See the listing in this issue beginning on 117.

CAN LEMON JUICE DO A JOB FOR YOU?

If you're a food processor... fresh, frozen or canned...fruits and vegetables...fish or fowl... lemon juice can do *at least* one thing for you:

- It can prevent or retard off-flavor tendencies...
- Maintain and even enhance natural food flavor—keep food fresh-tasting longer...
- Prevent oxidation, preserve color, texture and flavor during and after processing...
- Adjust acidity in low-acid foods–retard enzyme action...
- Replace salt in low-sodium diet foods...

And that's only a beginning. The list of jobs lemon juice can do is an extensive one.

If you're not using it...you may be letting the competition get a lead on you. Don't market a product that's merely "as good as" the rest. Exchange Brand Concentrated Lemon Juice—made by Sunkist—can often make it superior for only a penny or two—and add a selling ingredient of distinction to your label.

Why not let your Sunkist man talk it over with you?

The address: Sunkist Growers, Products Sales Dept., 720 East Sunkist Street, Ontario, Calif.

HELP YOURSELF TO OUR MOST EXPENSIVE RESEARCH

Have you a "good" product you'd like to convert into a superior one? A processing problem? An idea for a new product that doesn't quite come off?

Call on Sunkist citrus research for help.

We've been working 44 years squeezing new uses and products out of California oranges and lemons. The payoff has been 118 U.S. Patents...and over 400 new products.

All this "know how" is at your service. Sunkist technical men will be glad to work *with* you—in your own plant—or *for* you—in their own citrus research laboratory. Write, and a Sunkist man will call on you.

Exchange

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PRODUCTS SALES DEPARTMENT

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Process for new form of dry seasonings

In last month's article "Longer Storage Life for Spices", describing Spisoseals, a new form of dry seasonings, the statement was made that "the essential oils and/or oleoresins of the spice have been carefully blended with a dry base such as dextrose or salt, dispersed into a colloidal solution of edible gum and spray dried."

This is not correct. The oils and/or oleoresins are dispersed in an edible gum solution, spray dried and *then* blended with a dry base such as dextrose or salt. The entire portion is not spray dried, only the flavoring portion.

The same error was repeated in the caption for photos. The caption should read: At left, oils and/or oleoresins of spices are being weighed out. They are then dispersed into a solution of edible gum and spray dried in spray driers similar to the laboratory units shown at right. The encapsulated flavoring components are then carefully blended with a dry base such as dextrose or salt in a blender as shown in center.

Rennet substitute now available

A rennet substitute, known as Metroclot, is now available for use in place of or in conjunction with calf rennet extract in the manufacture of cheese.

Research has indicated that the rennet substitute is completely satisfactory for the manufacture of "short-cure" cheddar cheese. Qualified taste panelists have been unable to statistically differentiate between cheeses made with the substitute product and that made with calf rennet extract.

Research is still underway studying "long-hold" cheddar cheese made with Metroclot.

Available in 5-gallon containers, it is standardized at

KELCO COMPANY

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technical bulletin

Use unique Kelco Algin Colloids to improve your food products

Your Customers Delight In Pre-Packaged Dry Mix Desserts Made With Keltone. Pie fillings, toppings such as meringues and icings, and whipped desserts stabilized with Keltone are so luscious, so light, so easy-to-make with cold water—in just minutes! What texture Keltone gives pie fillings! So smoother, so creamy, they fairly float on your customers' fork. Pies stay fresher, longer!

A Vital Ingredient In a Pre-Packaged Dry Mix

Wherever water, milk or other aqueous media are added to your packaged dry mixes, you achieve important benefits in improved body and consistency, more effectively stabilized emulsions, and minimized loss of moisture or migration by using Kelco algin in your packaged dry mix.

YOURS ON REQUEST: Free samples of Kelco algin, and Technical Data describing properties and advantages, for *your* application. Write without obligation to your nearest Kelco regional office.

Use Keltose or Kelcoloid HVF, other unique Kelco algin products, for dry mix icings.

With Keltose in the formula, icings are retained on cake surfaces with greater gloss and stability. Stickiness of the icing is reduced so that it does not tend to adhere to wrapping. Cracking and peeling during exposure is reduced, drying out of icings prevented.

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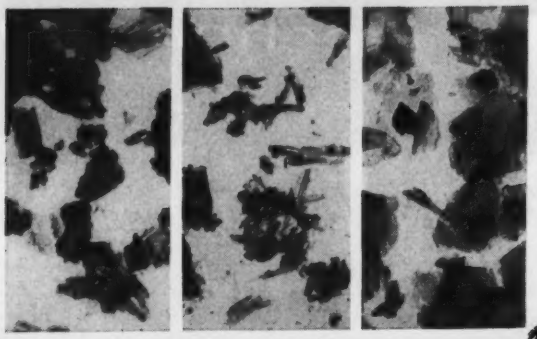
Electron micrographs of Micro-Cel A, C and E show particle structures ideal for food applications.

1μ



Micro-Cel helps keep food mixes bone dry!

Micro-Cel®, Johns-Manville's new synthetic calcium silicates, answers caking problems. Highly absorbent, it remains a free-flowing powder after absorbing triple its weight. High bulk (4½ lbs. to a cu. ft.), irregular particle shape and high surface area, make it ideal for coating sticky and hygroscopic particles. Micro-Cel gives low cost per pound-volume. To keep food mixes free-flowing, even under the worst conditions, try Micro-Cel. For information, samples and assistance, mail coupon below!

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In Canada: Port Credit, Ontario.

☐ Please send additional data.

☐ Please send free sample of suitable grade of Micro-Cel for use in:_____

☐ Have local Sales Engineer contact me.

Name_____ Position_____

Company_____

Address_____

City_____ Zone____ County_____ State____

Celite Division synthetic silicates used as anti-caking agents up to 2% are not considered food additives as defined by FD&C Act Amended, Section 201(s).

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an activity equal to certified rennet extract.

Supplier: Paul-Lewis Laboratories, Inc., 4215 N. Port Washington Ave., Milwaukee 12, Wis.

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FDA approves 82 more additives

A list of 82 ingredients which are generally recognized as safe for use in foods has been published by FDA. Included on the list, which follows, are spices, seasonings, essential oils and natural extractives.

Spices and Other Natural Seasonings and Flavorings (Leaves, Roots, Barks, Berries, Etc.)

- Alfalfa herb and seed
- Ambrette seed
- Angelica
- Angelica root
- Angelica seed
- Angostura (cusparia bark)
- Balm (lemon balm)
- Chamomile (cammomile), English or Roman
- Chamomile (cammomile), German or Hungarian
- Chervil
- Clover
- Elder flowers
- Galanga (galangal)
- Geranium
- Hoarhound
- Hyssop
- Linden flowers
- Sage, Greek
- Thyme, wild or creeping

Essential Oils, Oleoresins (Solvent-Free) and Natural Extractives (Including Distillates)

- Alfalfa
- Ambrette (seed)
- Balm (lemon balm)
- Bergamot (bergamot orange)
- Cacao
- Carrot
- Chervil
- Chicory
- Clover
- Corn silk
- Curacao orange peel (orange, bitter, peel)
- Dandelion
- Dandelion root
- Dog grass (quackgrass, triticum)
- Elder flowers
- Estragon (tarragon)
- Galanga (galangal)
- Geranium
- Glycyrrhizin, ammoniated
- Hickory bark
- Horsemint
- Hyssop
- Immortelle
- Laurel berries
- Lemon balm (see balm)
- Lemon peel
- Linden flowers
- Lupulin
- Malt (extract)
- Melissa (see balm)
- Menthol
- Menthyl acetate
- Molasses (extract)
- Orange, sweet, flowers
- Orange, sweet, peel

Rose buds
Rose flowers
Rose fruit (hips)
Rose leaves
Sage, Greek
Savory, summer
Savory, winter
Sloe berries (blackthorn berries)
Tamarind
Tannic acid
Thyme, wild or creeping
Triticum (see dog grass)
Violet flowers
Violet leaves
Ambergris
Castoreum

Natural Substances Used In Conjunction with Spices and Other Natural Seasonings and Flavorings

Algae, brown (kelp)
Algae, red
Dulse

Natural Extractives (Solvent-Free) Used in Conjunction With Spices, Seasonings, and Flavorings

Algae, brown
Algae, red
Apricot kernel (persic oil)
Dulse
Kelp (see algae, brown)
Peach kernel (persic oil)
Peanut stearine
Persic oil (see apricot kernel and peach kernel)
Quince seed

Details official methods for evaluating quality in natural spices

"Official Analytical Methods of the American Spice Trade Association" is a 45-page book of methods for evaluating quality in natural spices. The book, which contains 21 different procedures for testing spices, is divided into two sections.

The first section contains 12 methods which apply to most spices.

This begins with directions for preparing a spice sample for laboratory analysis, including recommendations for the grinding and pulverizing apparatus that is needed, as well as a discussion of techniques.

The analyses described in the first part includes ones for determining crude fiber, nonvolatile materials, moisture, total ash, acid soluble ash, starch (both by direct acid hydrolysis and diastase hydrolysis) and alcohol soluble materials.

Also listed are two different analyses for steam volatile oil, as well as a procedure for making a screen analysis.

The second section covers special methods that are re-

How Sweetose Syrup ensures precise control of browning and sweetness—gives

That "Magic Touch" of Balanced Flavor...Appetizing Color and Sheen that builds repeat sales!

In catsup, Sweetose holds that "fresh-pack" rich red color. Enhances flavor. Improves gloss and sheen.

In sweet pickles, Sweetose assures balanced sweetness; a tangier flavor with faster finishing, less softening.

It takes a touch of magic if pork and beans are to have the kind of flavor and appearance that will win *complete* customer approval in today's highly competitive sales race. And there's no surer, more economical way to give your beans this delicate "just-right" touch than with Sweetose, Staley's enzyme-converted corn syrup.

Sweetose ensures precise control of browning without excessive cooking. Gives beans a deeper, richer, more appetizing color and sheen. Imparts a balanced sweetness that never varies. Delivers a zestier, tangier flavor that builds consumer loyalty for your brand.

For complete information on the quality improvement advantages Sweetose can give in a variety of applications, see your Staley Representative or write to:

A. E. STALEY MFG. CO., DECATUR, ILL.

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quired for certain spices.

These include tests for piperine in pepper, cinnamic aldehyde in cassia oils, phenols in nutmeg and mace, volatile oil in mustard flour and mustard seed, extractable color in paprika and non-volatile methylene chloride extract of pepper.

Also in this section is a test for determining the amount of light berries and extraneous matter in pepper.

Methods were edited by Dr. P. R. Datta, a Research Associate of the American Spice Trade Association, at the Eastern Utilization Research and Development Division of USDA.

Publisher: American Spice Trade Association, 82 Wall Street, New York 5, N. Y.; Price: $5.00.

Ship tomato paste cross-country in sterile drums

In an important current application of the "bulk canning" process, originally described in FP, November 1958 ("Breakthrough in Bulk Canning"), tomato concentrate is being shipped cross-country from California for remanufacture by Delaware processor of Italian specialty foods.

Story on how "Sterilpac" drum method cuts costs and improves plant efficiency for processor —while still maintaining company's high product standards—appears on page 91.

Supplier: "Sterilpac" tomato concentrate from Flotill Products, Inc., Fresno & Charter Wy., Stockton, Calif.

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WILL DIAMOND CRYSTAL FLAKE-TYPE SALT ENHANCE THE QUALITY OF YOUR FOOD!

Diamond Crystal Salt is made by the exclusive Alberger process which produces a flake-type salt that is uniformly 99.95% pure. This amazingly high purity combats the danger of costly spoilage . . . helps prevent "off flavoring". . . and protects and enhances the quality of your product.

Diamond Crystal Flake-type Salt permits "maximum salting" for best flavor development in your product without the bitterness that is imparted by ordinary salt containing calcium, magnesium and metallic impurities. A less pure salt than Diamond Crystal Flake-type could form unappetizing scums and discolorations on vegetables, or stimulate oxidative rancidity in foods containing fats and oils.

Diamond Crystal Flake-type Salt is precision screened to provide a wide range of sizes to meet all your requirements.

Why not use the service offered by Diamond Crystal's staff of trained food specialists who will assist you in selecting the proper type salt for your product? For more information, call the nearest Diamond Crystal sales office or write to Diamond Crystal Salt Co., St. Clair, Michigan.

Diamond Crystal Salt Co.
ST. CLAIR, MICHIGAN

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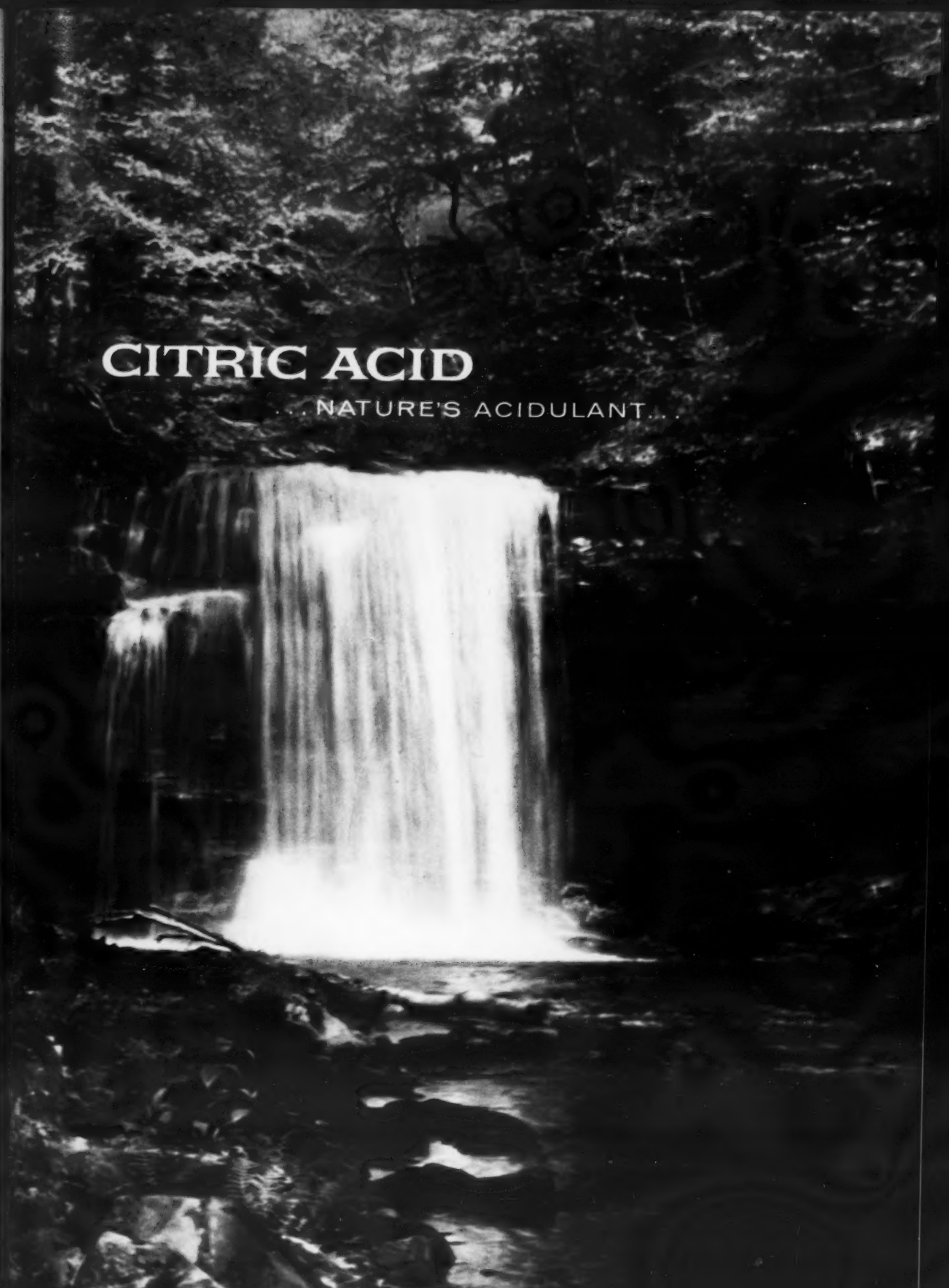
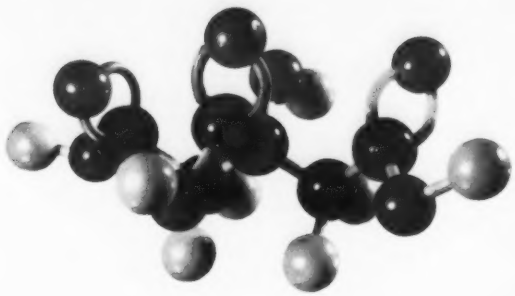

CITRIC ACID
. . . NATURE'S ACIDULANT . . .



Pfizer

CITRIC ACID

Nature's Acidulant

best for your fruit-flavored foods

So many fresh fruits get "tanginess" naturally from citric acid! This is nature's way of bringing out their full flavor.

Exactly the same kind of tanginess is insured in your fruit-flavored soft drinks, candies, jellies and many other products—by Pfizer Citric Acid.

Indeed, Pfizer Citric Acid has been a key product to the food industry for many years. The words "citric acid" on countless labels have established it as a familiar and trusted ingredient.

Don't gamble on quality and consumer acceptance with anything less than nature's acidulant —citric acid!

How Pfizer Pioneered in Production of Citric Acid in America

While the advantages of citric acid as a food ingredient have long been appreciated, the supply was at one time quite limited. Up until 1880, virtually all the citric acid used in this country was made in Europe. In that year, Pfizer conceived the idea of importing the raw materials from abroad and producing citric acid in the United States. The results were successful and Pfizer gradually became a leading manufacturer of this important commodity.

But production still depended on raw materials supplied from overseas. In a far-sighted decision around the turn of the century, Pfizer began to experiment with methods of producing citric acid from domestic materials. In 1914, this research program focused on the possibility of fermenting citric acid from a sucrose base. Five years later, Pfizer opened a pilot plant employing such a process.

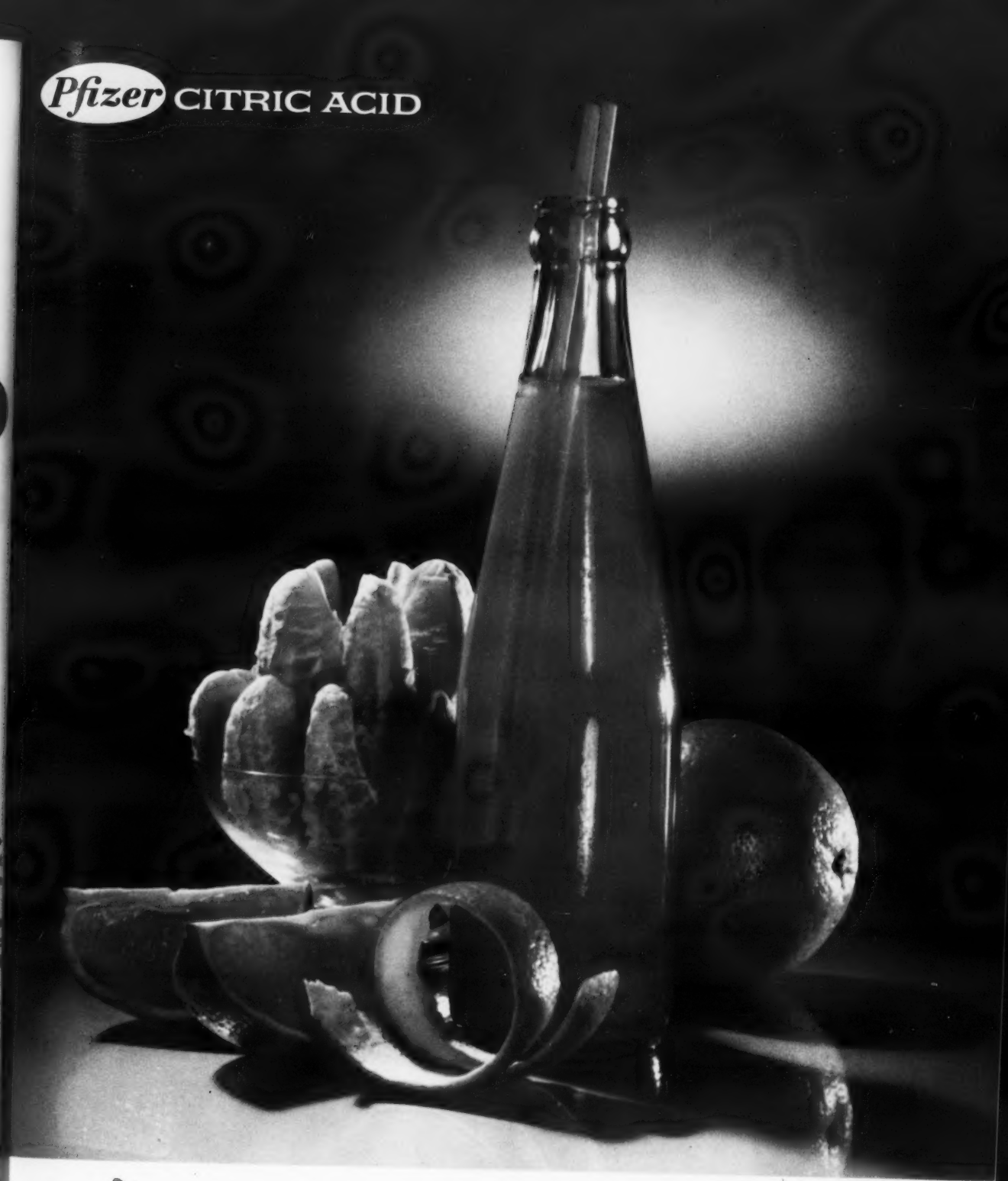
By 1923 the company was convinced that it had really found the formula for producing citric acid of the highest quality on an economical basis. A commercial production plant was put into operation and in 1924 American industry was receiving regular deliveries.

The Pfizer fermentation process proved so efficient that by 1939 the price of citric acid had been reduced to ¼ the pre-World War I price!

The American food industry was thus assured a readily available supply of economical citric acid from a dependable domestic source.

In addition, by enlisting the assistance of the Pfizer Technical Service staff, customers have shared in Pfizer's extensive knowledge of citric acid and effected sizeable time and money savings in product development and improvement.

You will see on the pages that follow some of the products in which this versatile acidulant serves as a key ingredient—ample evidence of the importance of citric acid in today's food industry!



Nature's Acidulant

TRADITIONALLY BEST FOR SOFT DRINKS

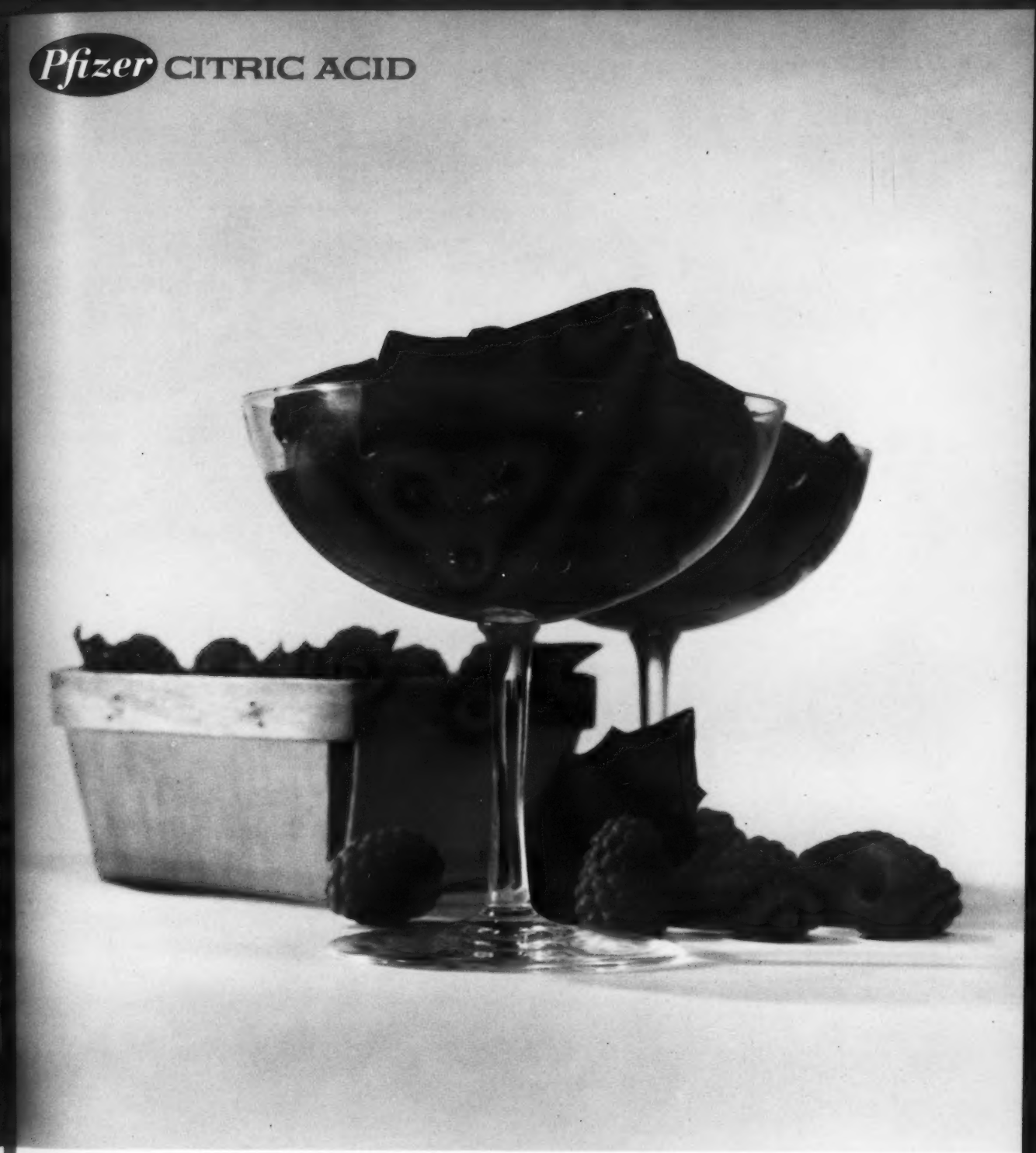
Citric acid gives soft drinks an authentic, natural tanginess!

Nature's Acidulant

TRADITIONALLY BEST FOR CANDIES

Citric acid is the acidulant you'll use with absolute confidence!

Pfizer CITRIC ACID



Nature's Acidulant

TRADITIONALLY BEST FOR FRUIT-FLAVORED DESSERTS

Citric acid gives fruit-flavored desserts that natural tartness!

Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR ICES AND SHERBETS

Citric acid's flavor-benefit is that "little extra" so important to true fruit taste!

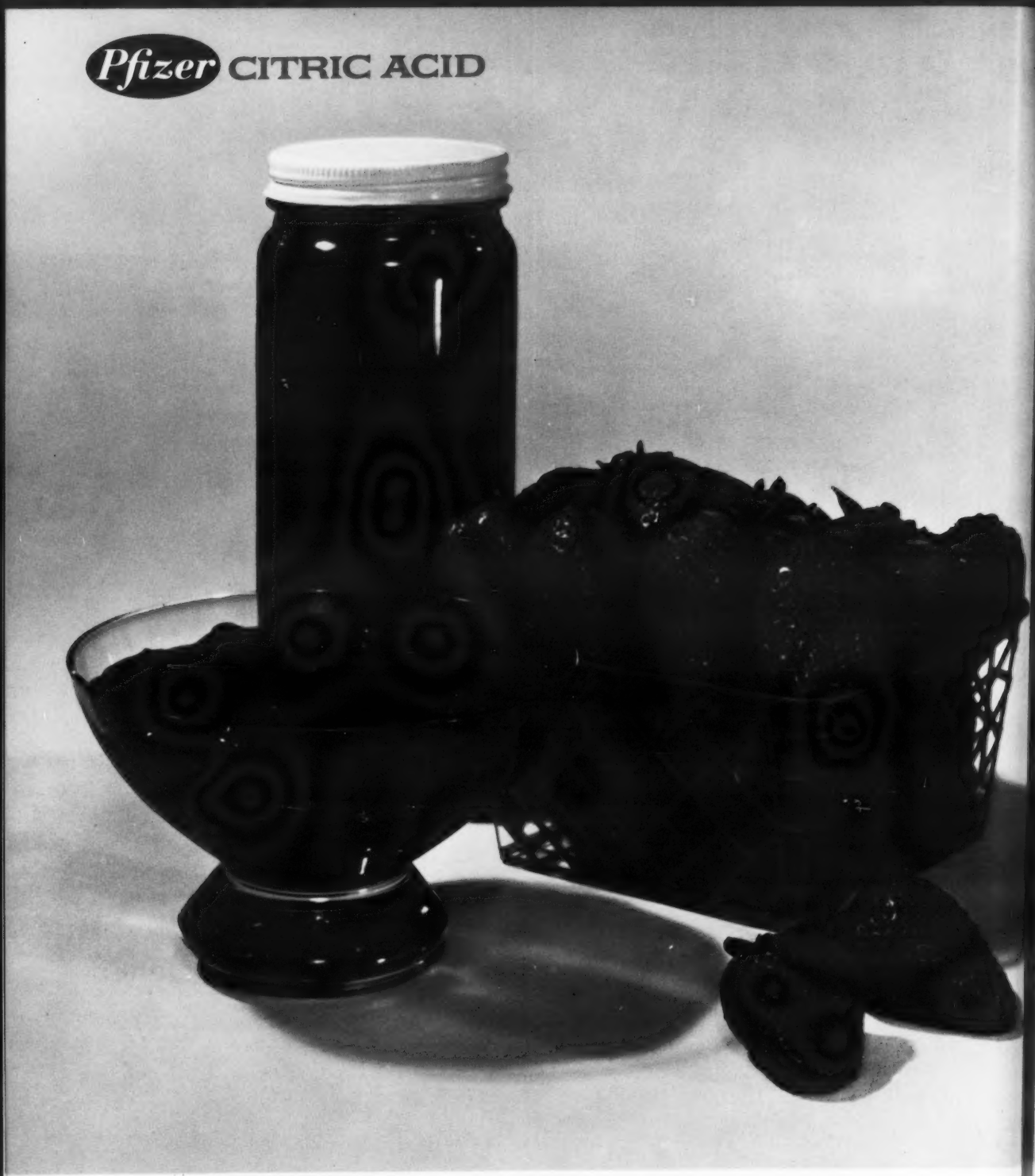
Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR CANNED FRUIT JUICE BLENDS

Citric acid gives a natural "lift" to real-fruit flavors!

Pfizer CITRIC ACID



Nature's Acidulant

TRADITIONALLY BEST FOR FRUIT PRESERVES

Citric acid helps bring out the tart-sweet goodness of fresh fruit!

Pfizer CITRIC ACID

Nature's Acidulant

TRADITIONALLY BEST FOR BEVERAGE POWDERS

Citric acid adds the tanginess that contributes to full, rich flavor!

Pfizer CITRIC ACID

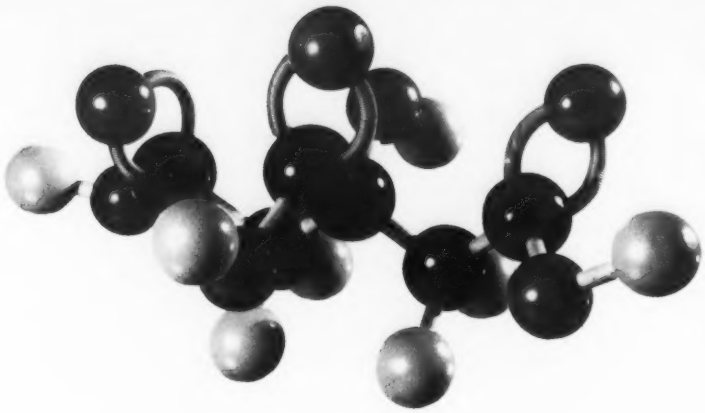
WHERE YOU MAY BE USING CITRIC ACID TOMORROW

In the future, uses for citric acid will extend beyond the area of fruit-flavored products. One area where citric acid may soon prove important is vegetables, particularly canned vegetables.

Small amounts of citric acid help control the pH level in canned tomatoes, beans, carrots and asparagus. Experiments in canned, whole tomatoes indicate that by controlling the pH with citric acid it may be possible to reduce processing time and/or temperature, resulting in a firmer whole tomato.

It has also been shown that citric acid sequesters trace metal contaminants in the pack, thus contributing to the quality of canned vegetables.

Pfizer, world's leading producer of citric acid, will continue to keep you informed on valuable new developments concerning citric acid—nature's acidulant.



Pfizer

CITRIC ACID

TECHNICAL INFORMATION

Pfizer offers citric acid in two basic forms—anhydrous and hydrous

CITRIC ACID, U.S.P., ANHYDROUS

This is produced as colorless, translucent crystals or as a pure white powder. It is odorless and has an acid taste. The compound is stable in the presence of light and air and resists caking under normal storage conditions. Because there is no water of crystallization present, anhydrous citric acid is particularly economical. Its reduced bulk leads to lower costs for handling, shipping, and storage. Furthermore, the lack of water of crystallization assures you of a uniform product and permits exact quality control.

CITRIC ACID, U.S.P., HYDROUS

This form of citric acid has been available for many, many years and is still counted on as a high quality acidulant for a wide variety of products. In physical appearance, taste and odor, it is similar to the anhydrous compound. However, it contains 1 mol water of crystallization (8.58% moisture). Stable in the presence of light and air, it will tend to lose water at high temperatures or in a dry atmosphere.

Various salts and esters of citric acid also find widespread application in the food industry. Two of the more prominent, sodium citrate and Citroflex® A-4, are described below.

SODIUM CITRATE

This sodium salt of citric acid is a versatile, easily assimilated product that has many uses in the food industry. Used as an emulsifier in cheese products, it produces smooth, even melting cheese that slices and spreads easily. Similarly, it improves the texture of ice cream. Pfizer Sodium Citrate acts as a buffer salt to control the pH in jellies, preserves, dessert powders, and canned fruit juice blends. And like citric acid, it also brings out true fruit flavor.

CITROFLEX® A-4 PLASTICIZER

Non-toxic, odorless, Pfizer Citroflex A-4 has been accepted by the Food & Drug Administration for use in packaging for both fatty and non-fatty foods. Citroflex A-4 (Acetyl Tributyl Citrate) shows excellent results in plasticized vinyl films for meat wrapping, vinyl coating for food containers and hot drink cups, and vinyl plasticizers for food jar liners and sealing rings. In addition, Pfizer Citroflex A-4 is excellent in polyvinyl acetate adhesives. Low in cost and high in performance Pfizer Citroflex A-4 is finding wide use in plastic coatings for the food industry.

PHYSICAL PROPERTIES OF PFIZER CITRIC ACID

	Anhydrous	Hydrous
Formula	$C_6H_8O_7$	$C_6H_8O_7 \cdot H_2O$
Molecular Wt.	192.12	210.14
Density	1.67	1.54
Melting Point	153°C	Loses water
Solubility, 25°C		
Water	161.8 gm./100 ml.	208.6 gm./100 ml.
Alcohol	59.1 gm./100 ml.	90.4 gm./100 ml.
Ether	0.75 gm./100 ml.	1.6 gm./100 ml.

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Recommended practices for . . .

Producing Steam of Culinary Quality

. . . FOR PROCESSING MILK AND MILK PRODUCTS

Because of the widespread use of steam in processing food products, the accompanying article is reprinted by special permission of the National Association of Dairy Equipment Manufacturers, 1012 14th St., N.W., Washington 5, D. C.

Steam, produced under these practices, should be acceptable under the provisions of the Milk Ordinance Code, 1953 Recommendations of the Public Health Service, for use in properly constructed and operated milk processing equipment.

To clarify current methods suitable for the production and transmission of steam satisfactory for use in steam-vacuum treatment or pasteurization by direct steam introduction into milk and milk products, the following procedures for providing steam of culinary quality are recommended:

Source of boiler feed water. Potable water or water supplies acceptable to the regulatory agency in jurisdiction shall be used.

Water containing organic materials such as leaves, algae, etc. should not be used for feed water without adequate pretreatment. (This is necessary to prevent such organic materials from causing foaming and priming in the boiler with resultant carry-over into the stream distribution system which could cause off flavors in milk).

Feed water treatment. Feed water may be treated if necessary for proper boiler care and operation.

Boiler feed water treatment and control should be under the supervision of specially trained personnel or a firm specializing in industrial water conditioning. Such personnel should be informed that the steam is to be used for culinary purposes.

Pretreatment of feed waters for boilers or steam generating systems to reduce water hardness before entering the boiler or steam generator by ion exchange or other acceptable procedures is preferable to addition of conditioning compounds to boiler waters.

There are a number of different chemicals that are commonly employed in boiler water treatment. These include sodium triphosphate, sodium hexametaphosphate, sodium hydroxide, sodium sulfite, sodium silicate, sodium aluminate and sodium alginate, all of which are nonvolatile.

Accordingly, there would be no objection of these compounds when they are properly used and the boiler is properly operated.

Tannin is also frequently added to boiler water to facilitate sludge removal during boiler blowdown. This product, while essentially nonvolatile, has been reported to give rise to odor problems, and for this reason should be used with caution. Compounds containing chromium shall not be used.

The compounds named above do not include all the compounds to which there is no objection. Compounds in addition to those cited above may be permissible but should be cleared with regulatory authorities having jurisdiction.

The above compounds are used to prevent corrosion and scale in boilers or to facilitate removal of sludge.

There are other compounds — namely, cyclohexylamine, morpholine and octadecylamine, which are volatile and are used to prevent corrosion in condensate return lines. Cyclohexylamine and morpholine are not regarded as hazardous in concentrations of

---

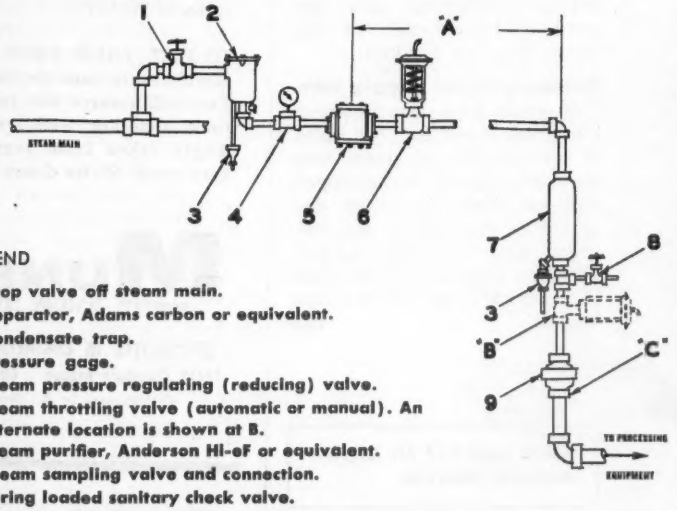
Diagrams of steam pipe line between steam main and point of introduction of steam into milk.

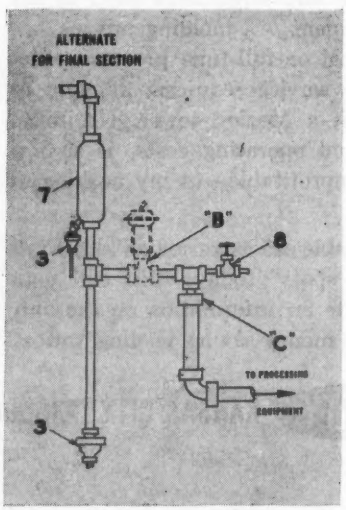
A desuperheater or sufficient length of piping to desuperheat steam shall be incorporated between the pressure regulating (reducing) valve and the steam purifier, shown as area marked "A".

"B" indicates acceptable alternate location for steam throttling valve.

Sanitary tubing and fittings shall be used between the point indicated, "C", and the processing equipment.

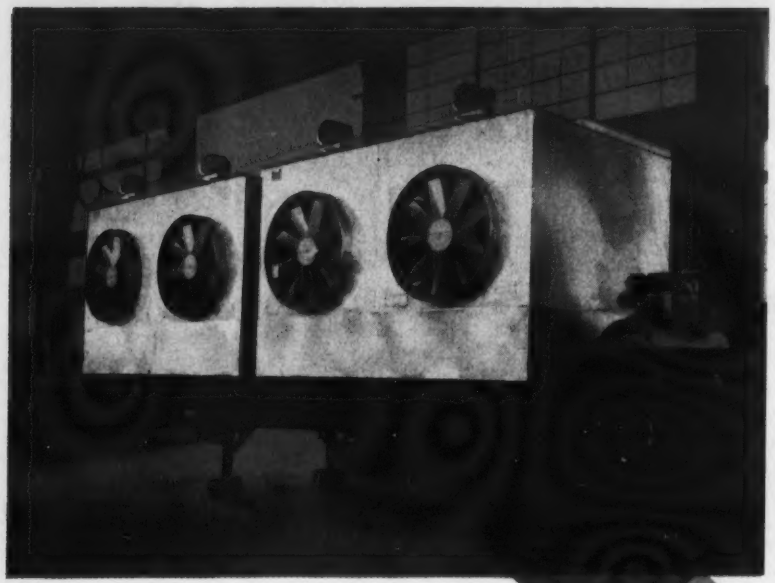
Additional valves, strainers, traps, gages and piping may be used for control and convenience in operation. The location of the steam throttling valve is not restricted to the positions indicated on the diagrams.





LEGEND

1. Stop valve off steam main.
2. Separator, Adams carbon or equivalent.
3. Condensate trap.
4. Pressure gage.
5. Steam pressure regulating (reducing) valve.
6. Steam throttling valve (automatic or manual). An alternate location is shown at B.
7. Steam purifier, Anderson Hi-eF or equivalent.
8. Steam sampling valve and connection.
9. Spring loaded sanitary check valve.



Marley Cooling Towers produce Profits for Pea Pickers

Vegetable packers are insuring fresh arrival at market by processing in the field with a new type of portable precooling plant. A critical part of this processing is water cooling and conservation, a job entrusted to these two Marley dual Aquatowers. Here, again, is an example of the versatility of Marley cooling towers that protect and increase profits throughout industry.

In every plant, there are "hot spots" that Marley towers can change to "profit spots." They may be as obvious as air conditioning, refrigeration, or steam condensing—or they may involve special operations and equipment such as air compressors . . . welding equipment . . . molding presses . . . quenching . . . unusual seasonal or full-time processing demands. The point is that *any* service requiring 25 gpm or more calls for consideration of a Marley tower. Its initial cost, as well as installation and operating costs, is so low that it makes water wasting unprofitable—to say nothing of its effect on plant efficiency.

Types and capacities available are as varied as industry's demands. Pinpoint your "hot spots" today; then call your nearby Marley engineer or write for information on the only complete line of water-saving, money-saving cooling towers.

THE MARLEY COMPANY MARLEY KANSAS CITY, MISSOURI

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less than 10 ppm in steam used in direct contact with foods other than milk.

However, because of the importance of milk in the diets of infants and children, these compounds should not be added to boiler feed waters when the steam is introduced into milk.

The use of octadecylamine in steam contacting food has not been sanctioned by the Food & Drug Administration and any approval in the future depends upon the presentation of proper application and information under the new Food Additives Amendment of the Federal Food Drug and Cosmetic Act.

Boiler operation. A supply of clean steam, dry and saturated, is necessary for proper equipment operation. Therefore, boilers and steam generation equipment should be operated in such a manner as to prevent foaming, priming, carry-over and excessive entrainment of boiler water into the steam.

Manufacturers' instructions regarding recommended water level and blowdown should be consulted and rigorously followed.

The blowdown of the boiler should be carefully watched, so that over-concentration of the boiler water solids and foaming are avoided.

It is recommended that periodic analyses be made of condensate samples. Such samples should be taken from the line between the final steam separating equipment and the point of introduction of the steam into the product.

Culinary steam supply line. The steam pipe line between the steam main and the point of introduction of steam into the milk should be equipped with at least the units depicted on the left in the diagram on preceding page. (Shaded diagram on the right shows an alternate for the final section). END

Check page 117 for helpful technical literature

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How to select power transmission equipment

A guide to the selection of mechanical power transmission equipment is subject of 468-page catalog D60.

Catalog covers a complete line of equipment with engineering drawings, dimensions, weights, prices, technical data in tabular form and many pages of selection and application information.

A separate section on general engineering data serves as a handy reference manual on mechanical power transmissions. A detailed index of material provides for quick, easy reference to specific equipment.

Catalog is available by request on company letterhead from Dodge Manufacturing Corporation, Mishawaka, Indiana.

Apply epoxy flooring with foam rubber roller

Chemical- and abrasion-resistant epoxy floor surfacing compound may now be applied with a foam rubber roller. This method provides greater speed and economy than former application by trowelling.

Epoxy coating, known as Epo-Floor-Top, may be applied to old concrete, wood, metal, etc. Completed job is a composite of chemically-resistant epoxy plastic and hard abrasion-resistant granules.

Immersion tests have shown epoxy floor surfacing compound has excellent chemical resistance to numerous materials.

Included among chemicals used in immersion tests were alcohols, ammonium chloride, 10% calcium hyperchloride, concentrated citric acid, ethylene glycol, fatty acids, fruit juices, glycerine, vegetable, mineral and petroleum oil, sodium chloride, starch, steam, sugar, tomato juice, vinegar, etc.

Supplier: Steelcote Mfg. Co., 3418 Gratiot St., St. Louis 3, Missouri.

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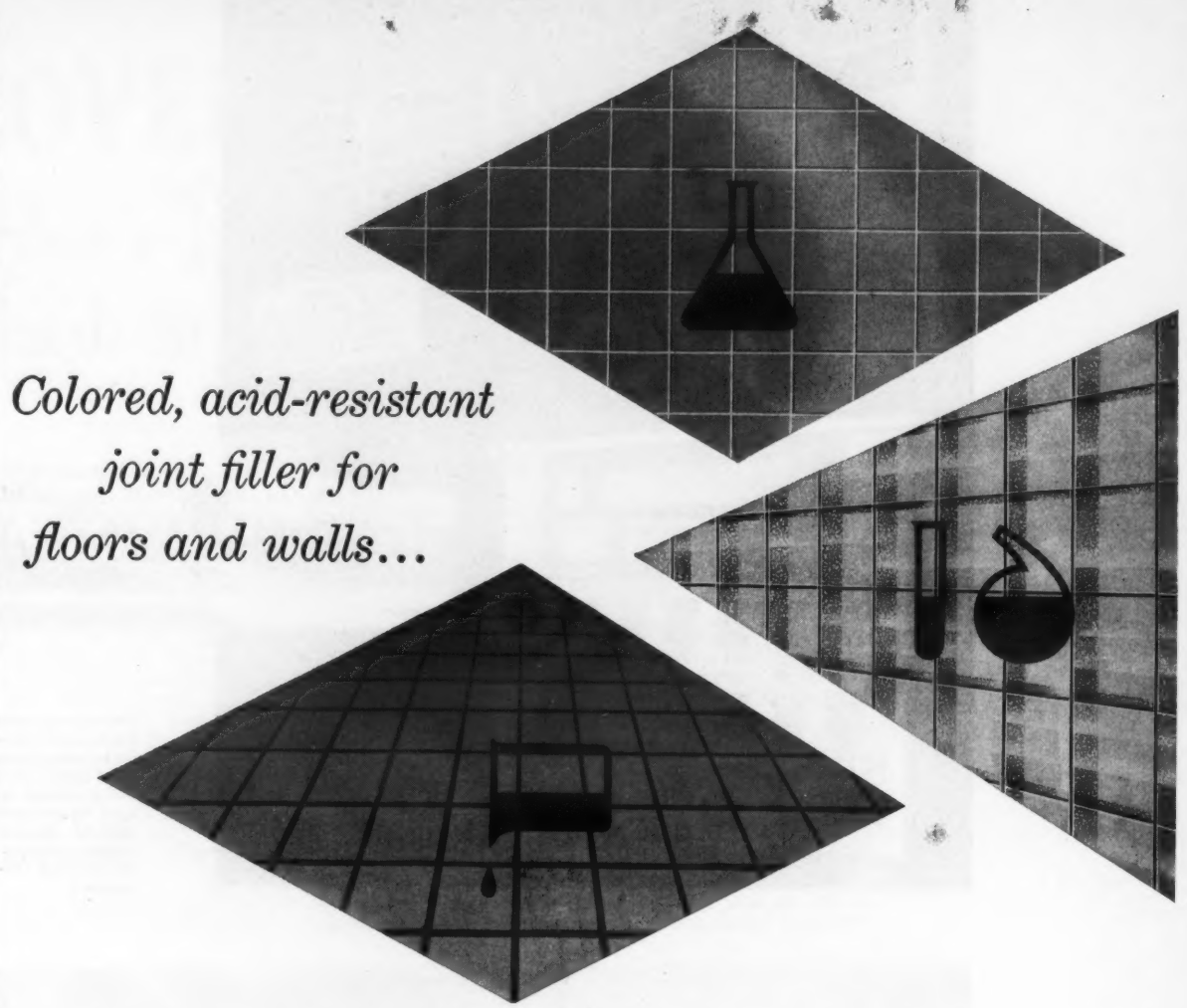

Colored, acid-resistant joint filler for floors and walls...

Supertite GROUT CEMENT

Supertite Grout Cement is a mortar type acid-alkali resistant grout cement that literally welds brick, tile or glass block together, resulting in a perfect, permanent floor or wall.

Supertite is immune to attack by food acids and will easily withstand cleaning solutions, organic chemicals and water. It is easily cleaned and sanitary and will not deteriorate with age. Supertite is permanent as the tile itself.

Supertite is an ideal cement for both new and old jobs because it sets quickly and bonds permanently, yet cleans easily before setting... will not discolor or damage tile.

Add years of service to walls and floors and eliminate contamination problems with Supertite ...available in three attractive colors.

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A Subsidiary of Amercoat Corp.

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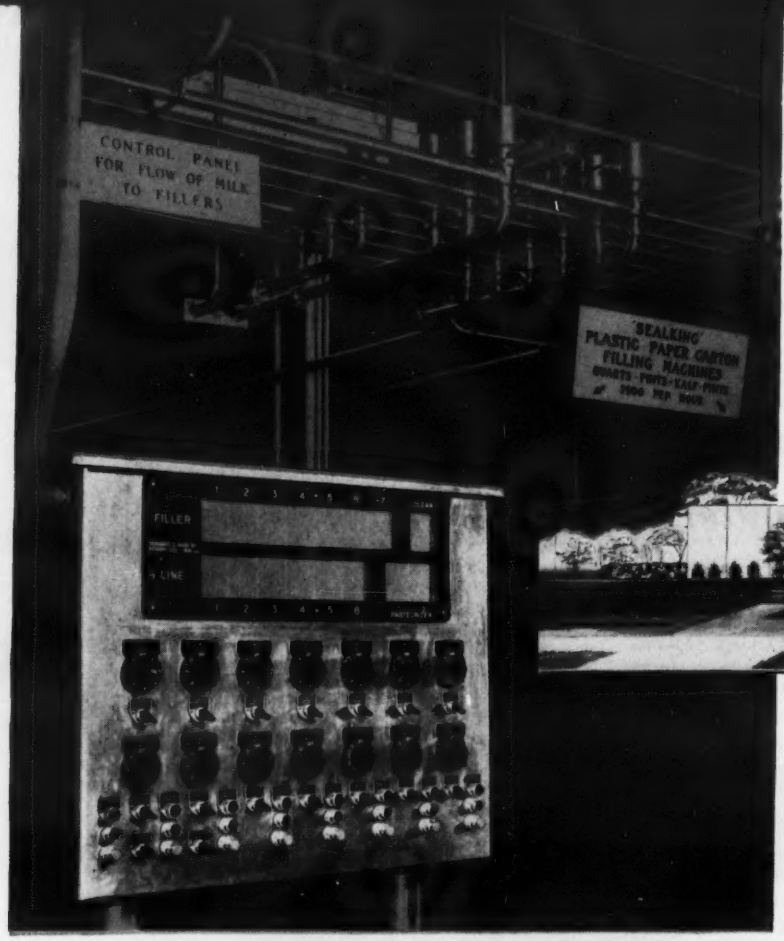
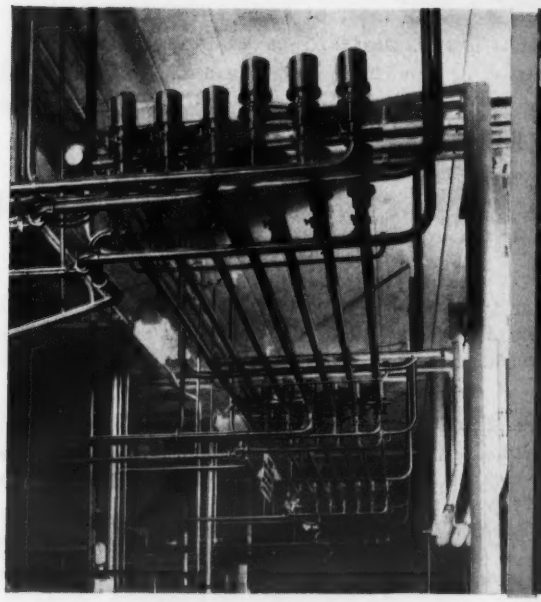
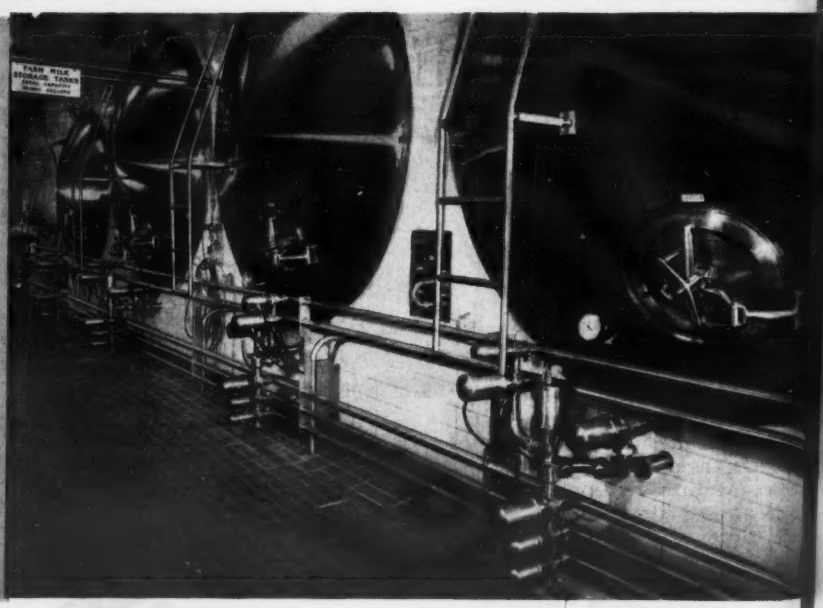


The control center at left automatically controls the flow of milk to fillers. Panel has a projection type digital display unit which shows at a glance exact status of filling operation.

The control panels, air-actuated valves, and valve manifolds are products of Ladish Co. Fesco Division, specialists in the design of automatic control systems . . . and in the installation of air-actuated valves and controls used in these systems.



"Fesco" air-actuated valves are the "heart" of the automatic processing operations. There are 152 of these efficient automatic valves installed in this plant for accurate control of liquid flow.



View showing a group of stainless steel farm milk storage tanks, having a combined capacity of 70,000 gallons. Filling operations, distribution of milk to pasteurizer, and CIP cleaning operations are controlled through seven "Fesco" valves connected to each of these tanks.

TRI-CLOVER EQUIPMENT

helps Borden's "Dream Plant" achieve new standards in Automatic Processing

INSTALLATION "HIGHLIGHTS"

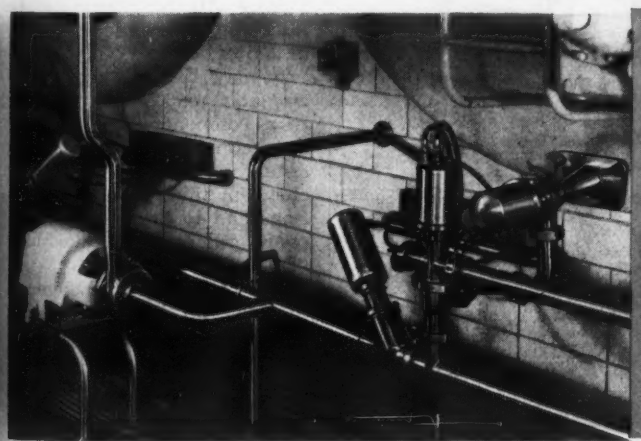
- 110,000 square feet of floor space
- Raw milk storage capacity, 70,000 gallons
- Can pasteurize, homogenize and cool 35,000 quarts per hour
- Capacity to process a half-million quarts of milk per day
- Control system utilizes over 30,000 feet of electrical wire
- Process lines inter-connected by almost 7,000 feet of stainless steel tubing
- Automatic flow control handled through 152 air-actuated valves

Wisconsin's largest, most modern milk and ice cream plant . . . Borden's *"Dairyland Showcase"* . . . is now in operation. With its processing capacity of 500,000 quarts of milk per day, this amazing plant could supply a pint of milk daily to every family in Wisconsin. It will be able also to produce five million gallons of famous Borden's ice cream per year.

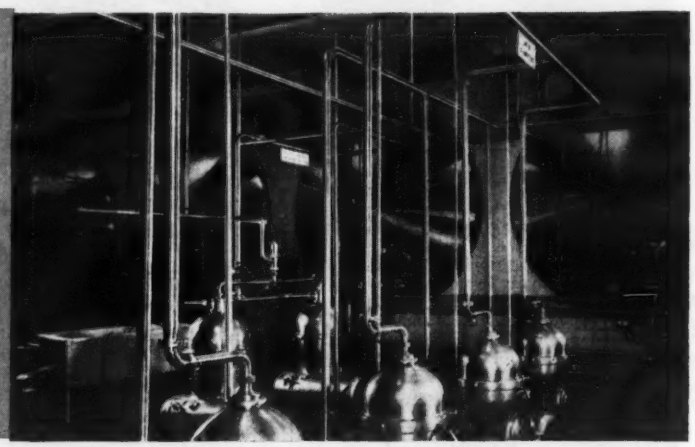
Ladish Co. is proud of the important part played by its Tri-Clover and Fesco Divisions in helping The Borden Co. achieve new standards of efficiency in the modern, automatic processing operations of this Wisconsin "Dream Plant".

The equipment, some of which is illustrated on these pages, was designed, manufactured and installed by Ladish Co. Tri-Clover and Fesco Divisions and includes 152 *"FESCO"* air-actuated valves . . . several modern, practical control panels . . . hundreds of "Tri-Weld" stainless steel welding fittings, welded in place with a "Tri-Welder" automatic welding machine right in the plant . . . numerous Tri-Clover sanitary centrifugal pumps . . . special pipe hangers and supports . . . as well as almost 7,000 feet of stainless steel tubing "Tri-Welded" on the job.

This "Showcase" Plant serves as a most striking example of the way in which the combined engineering ability, design and manufacturing skill of these Ladish Co. Divisions has helped to lead the way to modern automated dairy plant operation. Let this wealth of experience serve you in your next expansion program.



Valve manifold used for filling pasteurizer storage tanks and for transferring milk from these tanks to the filling machines. Also, note the simple, clean and effective method of mounting one of the many Tri-Clover pumps to permit fast, easy removal of the unit from the lines for inspection and maintenance.



"Tri-Weld" stainless steel butt weld fittings are employed extensively throughout this efficient Borden "Showcase" installation. The "Tri-Weld" lines installed above these clarifiers and separators were quickly and economically fabricated right on the job with Tri-Clover's new portable welding machine . . . The "Tri-Welder".

See your nearest Tri-Clover Distributor.

IN CANADA: Brantford, Ontario
EXPORT DEPT.: 8 South Michigan Ave., Chicago 3, U.S.A.

TRI-CLOVER

LADISH CO.
Tri-Clover Division
Kenosha Wisconsin

S-580

7747 on Reader Service Slip.

WHIP ACID, ALKALI & CHEMICAL FLOOR PROBLEMS

WITH

Steelcote **FLOOR-NU**

PATCH • RESURFACE • GROUT

ITS MANY ADVANTAGES ARE PROTECTED BY PATENT NO. 2,934,452

Don't let floor problems floor you. Eliminate them with FLOOR-NU.

It resists corrosion and extreme weight. Reduces floor repairs and reduces costs of labor and lost time. Protects new concrete, resurfaces or patches old.

SEND FOR NO-RISK TRIAL QUANTITY. Order the 26-lb. unit. Use half. It must please, or return prepaid for full credit.

protection for machinery and equipment heretofore impossible with an air dry organic finish

EPO-LUX 100

(AN EPOXY PRODUCT)

Protects against corrosion of acids, alkalis, and moisture where other coatings fail.

America's Foremost Wet Wall Enamel

DAMP-TEX WET WALL ENAMEL

FOREMOST IN PROVED PERFORMANCE

More than 10,000 plants attest to the satisfaction you expect AND GET from DAMP-TEX.

FOREMOST IN MONEY-SAVING QUALITY

Send for details of NO-RISK trial offer.

STEELCOTE MFG. CO. 3418 GRATIOT ST. ST. LOUIS 3, MO., U.S.A. RODNEY, ONTARIO, CANADA

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got a **SPRAY NOZZLE** *problem?*

perhaps one of our **DATA SHEETS** *can suggest a solution*

For almost every spraying application, there's a Spraying Systems Data Sheet that gives useful information on suggested installations and types of nozzles to use. If you have a problem, write and let us know the application involved . . . and we'll send the Data Sheet that applies.

SPRAYING SYSTEMS CO.

3213 RANDOLPH STREET • BELLWOOD, ILLINOIS

And . . . for complete spray nozzle information, write for Catalog 24.

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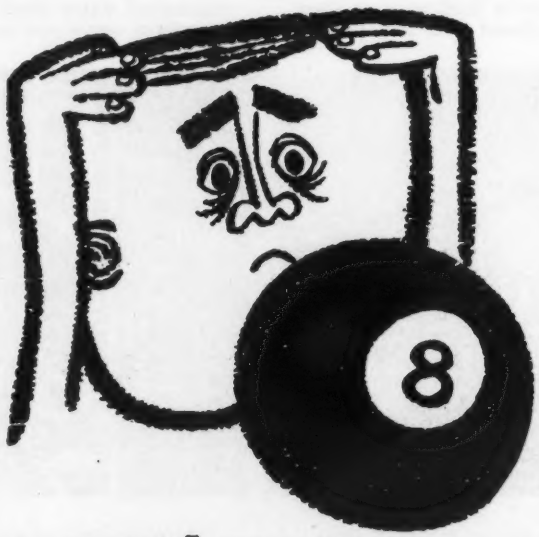


need more information . . .

Note there is a key number at the end of editorial articles or advertisements. To request more information circle the proper number on the convenient form opposite the last page. Send the form to us . . . we do the rest. Information comes direct to you. No obligation, of course.

Air conditioning and drying systems described

Air conditioning and drying systems are described and illustrated in 16-page, 3-color bulletin entitled "Dollars Out Of The Air". Equipment is used to stop condensation, speed drying and other processing operations, obtain subfreezing dewpoints and make air sterile.

Bulletin, issued by Kathabar Air Conditioning and Drying Systems, Surface Combustion Div. of Midland-Ross Corp., also covers climate control rooms. These prefabricated standard test rooms are designed to establish and produce almost any temperature, humidity and bacteria controlled conditions desired.

7750 on Reader Service Slip.

Expanded tubing shrinks to form a tight fit

Thin and standard wall Teflon-TFE tubing, which has been expanded mechanically, will recover original dimensions when subjected to heat. Tubing will thus clamp tightly to any inserted object to form a tighter fit.

It may be used to encase irregular shapes, protect electrical components such as wire connectors, terminals, and semi-conductors, etc., to join chemical tubes and metal fittings and to provide tight fits over rollers and machined parts.

Available in 11 basic colors, printed and cut to required lengths, tubing can be made cementable. It offers good dielectric strength (500 to 1000 volts/mil), lowest dielectric constant (2.0) and dissipation factor (0.0002) of any solid dielectric.

Tubing is unaffected by any commercial chemical, has no change of electric properties with temperature (−25 C to 250 C) or frequency (60 cycles to 100 mc) and has zero moisture absorption.

Supplier: Pennsylvania Fluoroearbon Co., Inc., 1115 No. 38th St., Philadelphia 4, Pa.

7751 on Reader Service Slip.

High speed, high shear mixing increases volume, improves quality

French dressings improved —

Special patented blade designed especially for processing of French dressings, greatly improves quality and stability.

Pectin dispersed without heat —

In manufacture of jams, jellies, etc., difficult pectin agglomerates broken down and batches completed in five minutes. Pigment concentrations upwards of 80% easily handled, allowing for let-down with any desired liquid.

Costs cut in polyethylene dispersions for food wrapping materials —

The COWLES Dissolver can be used to make dispersions at using concentrations or to make concentrates for let-down at time or site of usage. Concentrations as high as 50% of 12,000 MW polyethylene, 30% of 20,000 MW polyethylene and 30% of butyl rubber in waxes can be made. At these concentrations, either paraffin or microcrystallin wax can be used as the vehicle. Using premelted wax, batches can be turned out on 30 minute cycles.

Bakery Products —

Cowles is finding continuously increasing favor with many bakeries throughout the country for creaming shortening, milk and sugar; making sugar toppings for sweet rolls, and similar preparations. Reasons — more volume in less space, at less cost — improved quality.

Fruit juice concentrates —

Cowles saves hundreds of man hours for soft drink and soda fountain supply manufacturers in fresh fruit dispersing operations. Improves quality of end products, such as fruit concentrates, syrups, toppings, etc., too.

Now, in addition to "the teeth that make the BIG difference" the new Cowles Super Series Dissolvers feature the exclusive, new MPD* (Maximum Power Delivery) transmission system that is capable of delivering 90% of motor horsepower to the impeller even at lowest speeds. They will produce many times as much as ordinary mixers . . . better, in less space, at less cost.
Let us prove it in your plant at our risk!

Write today for complete information

MOREHOUSE-COWLES, INC.
1150 San Fernando Road, Los Angeles 65, California

MOREHOUSE COWLES

Representatives in Principal Cities
Convenient Lease and Time-Payment Plans

Please send me information on use of Cowles Dissolvers in processing (product) .....
.....
Name ..... Title .....
Firm .....
Address .....
City ..... Zone .... State .....

*Trademark of Cowles Dissolver Company 618

7752 on Reader Service Slip.

Over 30 insulations for every use

A full line of over 30 industrial insulation materials are described and illustrated in 1960 catalog on "Heat-Cold Insulations". Properties and specifications of the line of heat and cold insulations are presented for service from sub-zero temperatures up to 1900 F.

Information on spun mineral wool, calcium silicate and 85 per cent Magnesia products in block, blanket, felt, fill, cement and pipe insulation forms are included in 24-page, two-color booklet, available from Baldwin-Ehret-Hill, Inc., Industrial Insulation Div.

Thermal conductivities and tables of recommended thicknesses are given for each product for appropriate temperature ranges. Illustrated application instructions are also included.

A selection chart, which indicates the temperature range of all included types of material, is presented along with illustrations of typical installations.

In addition, an insulation specification guide identifies products with appropriate Federal, ASTM, US Maritime Commission and military specifications, as well as the US Dept. of Commercial Standards.

7753 on Reader Service Slip.

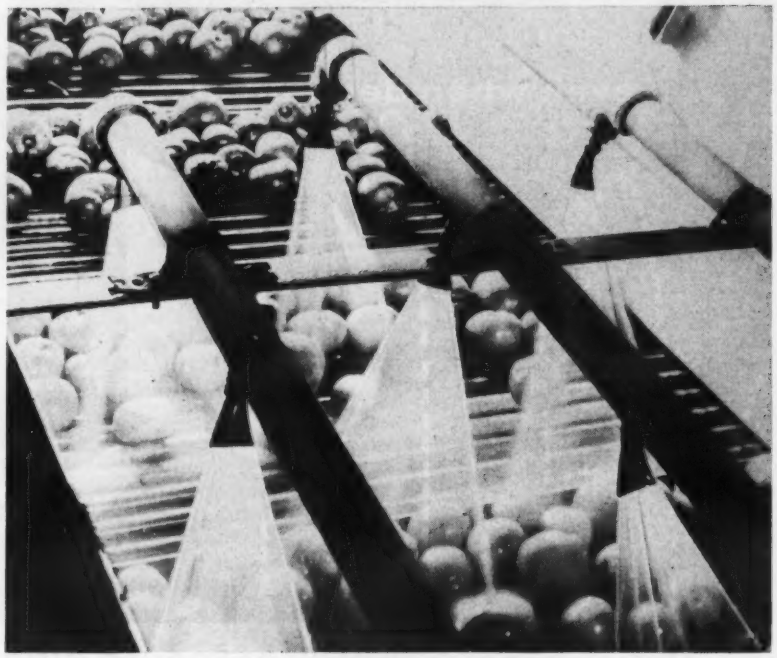
Flexible hose designed specifically for steam

Uses: Flexible White Steam Line Hose has been developed specifically for use with steam to overcome damaging effects of constant steam flow through a hose line.

Feature-Description: Hose incorporates an extruded Teflon innercore, pure bronze wire reinforcing braid and swaged fittings to provide reliability with resistance to deterioration, abrasion, scaling, blow-offs and leakage.

Innercore will not embrittel, work harden or deform even after millions of flexing cycles at 400 F. It is completely

The big PLUS (SERVICE · EXPERIENCE · RESEARCH · PERFORMANCE) in Oakite



How to Assure Cleaner Produce Through Wetter Washing

ADDING OAKITE "78" to water gives you the extra "wetting" action you need to drastically reduce bacteria counts and remove field soils, insects, molds and chemical spray residues. Moreover, Oakite "78" retards the wilting of fresh produce and thereby helps add days to shelf life.

CONSIDER THESE FACTS: In one comparison test, leaf produce cleaned by water alone showed a bacteria count of 350,000 organisms per gram. When just ¼ ounce of Oakite "78" was added to each gallon of water, the count dropped to 19,000 per gram—a 95% improvement.

RESULTS OF OTHER TESTS: Oakite-washed Broccoli, celery, lettuce and radishes stayed fresh after three days on the shelf, while control samples washed only in water were badly wilted. On tomatoes, the extraordinary detergent action of Oakite "78" solved the drosophila egg problem time after time.

The big PLUS in Oakite

Continuing research like this is only one of the big plus factors you get with every pound of Oakite materials. Others: personal assistance . . . Oakite's vast experience . . . coordinated sanitation programs to save man-hours and materials . . . materials that give dependable performance. Write for data. Oakite Products, Inc., 44F Rector Street, New York 6, N. Y.

OAKITE
over 50 Est. 1909 SCIENCE
years' leadership in industrial cleaning

7754 on Reader Service Slip.

FROM THE WORLD LEADER IN PACKAGED AUTOMATIC BOILERS AND BURNERS

Powermaster® holds pressure steady

...result is better, more dependable processing. This is only *one* reason why *Powermaster* outperforms any other boiler at less cost. Want proof? Call your nearest O&S representative or write direct for Bulletin 1260.

75th

ORR & SEMBOWER, INC.

Powermaster®

PACKAGED AUTOMATIC BOILERS

7755 on Reader Service Slip.

resistant to most chemicals, thereby providing protection against steam additives and vaporized oils in the steam lines.

All bronze wire reinforcing braid provides protection against rush. It is braided in a pattern that provides maximum flexibility with long fatigue life and burst strength.

Hose is available either as assembled lengths or as specialized hose lengths with separate fittings for assembly at plant location with compact swager.

Sizes range from ¼" to 1" standard hose size. Burst pressures are approximately six times the maximum recommended operating pressures.

Supplier: Titeflex, Inc., Hendee St., Springfield, Mass.

7756 on Reader Service Slip.

How to get the most from in-place cleaning

How efficiency and economy are made possible through the adoption of an engineered clean-in-place system is emphasized in 8-page booklet from Oakite Products, Inc.

Methods, materials and equipment for cleaning-in-place are described. Booklet also discusses requirements for solution tank and pump and points out that cold milk and hot milk lines require different circulation times, detergents and methods.

A discussion of the job the detergent is required to do, the removal of soil and its dispersal in solution and the complete rinsing of soil from the surface is also included.

The six essential characteristics a detergent should have for thorough, dependable cleaning-in-place are listed. Detailed information is provided on the cleaning procedures recommended for cold milk equipment, hot milk processing equipment, HTST pasteurizers and deodorizers.

Specific equipment, designed for in-place cleaning of holding tanks and milk tank trucks, is described and illustrated.

7757 on Reader Service Slip.

Sifter has only three product-contact parts, all made of stainless steel: top pan, screen with baffles and bottom pan

Simple, sanitary sifter has quiet, vibration-free motion

Features dynamically balanced drive mechanism

NAME of sifter, "Cirlyptic®," is derived from its motion which is circular-elliptical in vertical plane. Motion is transmitted to sifter from drive mechanism which consists of a cam, mounted on axle between two counterweights, see photo below.

Machine is of simple, yet sanitary design. Having only three major parts and quick-action hold-down clamps, see photo above, it is easy to take apart and clean. Only one minute is required for disassembly.

Sifter's motion speeds screening. It causes particles to be in continuous suspension in an evenly distributed layer above screen. Screen moves through area of suspended particles which in turn pass through screen into product removal zone.

Cycle is repeated 300 to 600 times per minute. The faster the rpm, the longer particles are suspended and the slower materials move down screen.

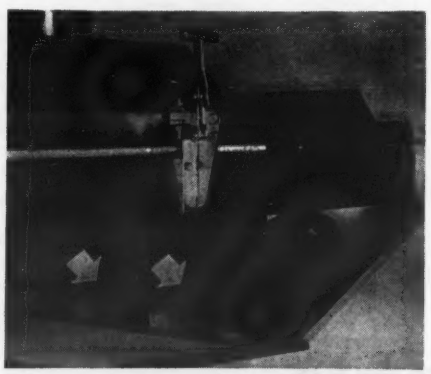
Motion of sifter is quiet and practically free of vibration. As a result, caster mounting for mobility is possible.

To obtain optimum screening efficiency time that materials are on screen can be varied from 3 seconds to several minutes. Screen retention time is controlled by adjusting spreaders, baffles or speed of agitation.

Machine has single horizontal screen and baffles; can make up to four product splits as follows: fines, middlings, coarse and tailings.

Sifter, available from Entoleter, Inc., PO Box 904, New Haven 4, Conn., has dust-tight cover or side shields for visual control. For small-capacity model, height is 80 in., width is 30 in. and length is 87 in.

Machine is made in three capacities up



Almost perfect dynamic balance of drive mechanism is achieved through counterweights, arrows. Front of machine oscillates on two connecting rods, each with two outboard bearings

Of all the features you want in a thermometer

ONLY WESTON HAS THEM ALL!

Weston 4,000 Series Bi-Metal Thermometers are "tailor-made" to include the important features wanted in industrial thermometers. Here are the reasons why these instruments have become the standard of accuracy and long-term reliability:

Guaranteed Accuracy . . . ± 1% of range.

Long Life . . . rugged, all-stainless steel construction— including welds.

Ease of Reading . . . in-line scale and pointers eliminate parallax errors.

Fast, Dependable Thermal Response . . . exclusive Weston multiple-helix sensitive elements.

Maximum protection against "Breathing" and Leakage . . . special gasket material assures extra-tight seal.

Removable Bezels . . . on-the-job glass replacement is simple.

External Adjustment . . . conveniently located on side of cases.

Choice of Type for Every Application . . . 3-inch or 5-inch heads; back and bottom connected models with rotatable scales; stem length up to 72 inches; ranges from —100 to 1000°F or —100 to 500° C.

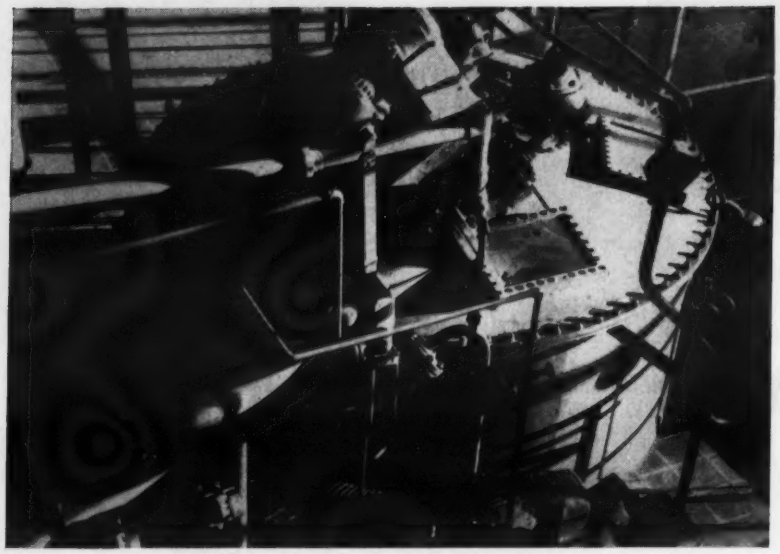
Call your Weston representative for full details, or write: Weston Instruments Division, Daystrom, Inc., Newark 12, New Jersey. International Sales Division, 100 Empire St., Newark 12, N.J. In Canada: Daystrom Ltd., 840 Caledonia Rd., Toronto 19, Ontario.

DAYSTROM, INCORPORATED
WESTON INSTRUMENTS DIVISION
Weston for Dependable Accuracy

7758 on Reader Service Slip.

Unique vegetable oil extraction process depends on . . .

OLIVER® HORIZONTAL ROTARY FILTER



Oliver Horizontal Rotary Filter at Cia. Productora Nacional de Aceites, S.A. plant—an outstanding example of the success of the solvent extraction process for vegetable oil production.

Up to 99% extraction from sunflower seed meats and rice bran without pressing achieved at plant of Cia. Productora Nacional de Aceites, S.A., Santiago, Chile.

The "Filtrex" direct solvent extraction process, developed by Wurster & Sanger, Inc., Chicago, Ill., is demonstrating its efficiency in a plant established by Cia. Productora Nacional de Aceites, S.A., Santiago, Chile. Materials handled: sunflower seed meats, sunflower seed cake and rice bran.

The major equipment item and key to the simple, economical operation of the Filtrex process is the Oliver Horizontal Rotary Filter. This unit separates the full miscella (vegetable oil-hexane mixture) from the meal solids and counter-currently washes the solids to remove entrained miscella. Arrangements provide for 5 liquid cuts: separation of full miscella from solids, recirculation of miscella over filter cake to remove fines, followed by three cuts from progressively lower oil content miscellas, the last wash being oil-free hexane. Extraction efficiency ranges up to 99%.

This application is another example of the adaptability of the Oliver Horizontal Rotary Filter to a wide range of filtration and counter-current washing operations. For information, write to Dorr-Oliver Incorporated, Stamford, Connecticut.

DORR-OLIVER
WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

7759 on Reader Service Slip.

to 1000 lb/min. Motor size varies from 1/3 hp to 3 hp depending upon capacity. Screens are available in 10, 20, 30, 40 or other mesh sizes.

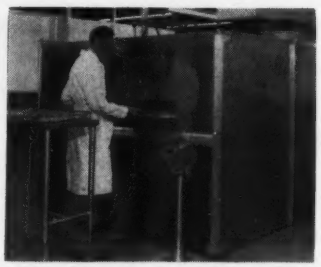
7760 on Reader Service Slip.

Demonstrates freezing with liquid nitrogen

Cuts freezing time to 5 minutes

At Glendale, Calif. plant of Idaho Maryland Mines Corporation, method of freezing foods by immersion in liquid nitrogen was successfully demonstrated.

Cooked foods were fed into Liquifreeze unit directly from package filler at temperature of 160—180 F. Product immerged from unit in less than



Baked macaroni at 160 F are frozen to below 0 F in less than four minutes. Console to right of operator houses controls

five minutes at temperature below zero F.

Automatic process takes place in freezer 16 ft long, 8 ft wide and 8 ft high.

To freeze foods, either open or sealed packages of the product are placed in wire baskets which are set into cradel-conveyor of machine.

Conveyor first carries packages through gentle shower of liquid nitrogen which immediately freezes top layer. This prevents subsequent shifting of product during initial stage of immersion.

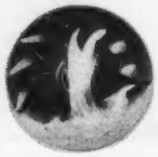
Conveyor next carries packages through pool of liquid nitrogen at —320 F. Packages are ready for storage or ship-

Highly Intimate Blends in 1 to 2 Minutes

Blends while discharging; No segregation or flotation

Sturtevant Rotary Blenders start 4-way blending while charging, continue it during discharge, thus producing highly intimate, even blends of dry and semi-dry materials – within 3 to 5 minutes of start of charging.

Six *complete* blending cycles per hour are common. And Sturtevant's special action produces no particle reduction, cleavage or attritional heat – is highly effective yet gentle and safe even with explosives.



Receiving

Scoops cascade material as drum rotates. Movement forces material from both ends to middle. Thus blending is 4-way right from start of charging.

Discharging

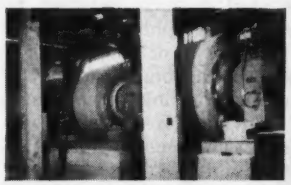
Single gate controls charge, discharge. Blending continues throughout discharge phase. Result is no segregation or flotation — highly intimate, even blends.

Self-cleaning, dust-sealed drum; one-man accessibility

Operation of Sturtevant Blenders is self-cleaning – drum interiors are completely dust-sealed. For inspection of all models one man simply loosens a few lugs to remove manhole cover – quickly and easily.

Nine standard models with capacities to 900 cu. ft.

10 cu. ft. Sturtevant Blender at U.S. Steel Corp.'s new Applied Research Laboratory (Raw Materials Division) in Monroeville, Pa. This unit handles batches up to 500 lbs. — is ideal for pilot work and small runs.



Automatically controlled, three 50 cu. ft. Sturtevants blend chocolate powder and other ingredients for Hershey Chocolate Corp. Operating in a group, each Blender can process more than a ton per batch. Quick accessibility and self-cleaning features keep maintenance to one hour per week.

Fully or semi-automatic, or manually controlled operation

Constructed of carbon steel, stainless steel or Monel metal, Sturtevant Rotary Blenders are engineered to fit each customer's needs – can be supplied with injector sprays and any desired control system.

For more on Sturtevant Blenders, request Bulletin No. 080B. (Bulletins also available on Mixers, Air Separators, Micronizers, Crushers and Grinders.) Write today. STURTEVANT MILL CO., 122 Clayton St., Boston, Mass.

7761 on Reader Service Slip.

ping as they leave unit.

Immersion time and overall speed, as well as exit temperature can be regulated according to type, size and density of food.

Exhaust hoods at entrance and exit of unit collect gaseous nitrogen which is piped to reliquifier.

Although freezer has not been in operation for sufficient length of time to make actual cost comparisons, several economic advantages are claimed by supplier, such as less floor space and lower manhour requirements.

Because of short freezing period, orders received in morning can be delivered on same day, thus cutting inventory and storage space.

Demonstration unit is scheduled for installation on East Coast. Different size models of immersion freezer will be available.

Supplier: Liquifreeze Company, Inc., 26 Broadway, New York 4, N.Y.

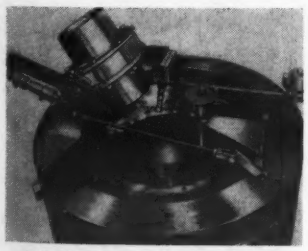
7762 on Reader Service Slip.

Minimizes breakage of fragile crystals

Uses: For washing and separating materials of fine crystalline structures such as Alberger salt . . . salt of monosodium glutamate.

Features-Description: Breakage of crystalline materials is held to minimum by charging and discharging arrangement. Slurries can be charged while machine is running at reduced speed. Entire basket of solids can be discharged with one stroke of pusher, also at reduced speed.

Trigger float in unit stops



Centrifugal normally operates at 1000 times gravity; can be built for other suitable speeds

now . . . handy smaller size . . . new features

Tote Boxes

by WEAR·EVER

WEAR-EVER ALUMINUM TRADE MARK REG. U.S. PAT. OFF.

Smooth, rounded, easy-to-clean corners
#24 Over-all Size: 23⅞" x 17-1/16" x 10⅜"
#24 available without handles to fit Cres-Cor Pan Rack
Exclusive Open Bead design
Stack when filled
Strong, smooth one-piece handle
Nest when empty
#35 Over-all Size: 34 3/16" x 16⅞" x 12"
Dolly available for #35 shown at left

You asked for it . . . a smaller version of the famous Wear-Ever #35 Tote Box. It's our new #24, shown at top in the above illustration, and it's available *now*.

We've designed it particularly for you whose needs call for a lighter, smaller, easier-to-handle container. It is available without handles, to fit perfectly in a Cres-Cor pan rack.

This new box incorporates the same quality construction features as our standard size box—special extra hard wrought Wear-Ever Aluminum Alloy, sanitary open bead and extra strong, double-embossed bottom.

Like its big brother, shown in the smaller photo, this new box stacks when full, nests when empty and is available with your identifying imprint on side or end, if desired.

For full information on our complete line of food handling items, call your local Wear-Ever man, or send coupon below.

WEAR·EVER ALUMINUM UTENSILS

Wear-Ever Aluminum Inc.
6812 Wear-Ever Bldg., New Kensington, Pa.

GENTLEMEN: *I'd like to know more about your Tote Boxes and other handling equipment.*

☐ Send me your catalog. ☐ Have your representative see me.

NAME.....

TITLE.....

Fill in, clip to your letterhead and mail today.

NEW IDEA! *Wear-Ever's new Nickel Scouring Cloth. Won't scratch, won't mar, far outlasts ordinary scouring cloths. At your dealer's.*

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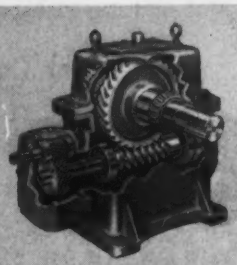
From THE ONE COMPLETE LINE of Power Transmission Drives

WORM GEAR DRIVES

- 162 sizes; 17 types
- 1½" to 20" Center Distances
- Output Torque to 500,000 lb. in.
- Capacities From .01 to 165 HP



Horizontal Single, Double Reduction

Fan-Cooled

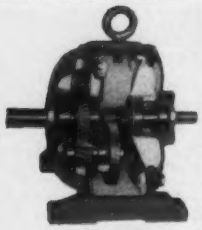
Vertical Single, Double Reduction

Vertical Single, Double Reduction for use with Extended Output Shafts

Foote Bros. Worm Gear Drives combine precision generated worm gearing with balanced design bearings and shafts to deliver economical, dependable right angle power for any application. Drives are rated to AGMA Standards. Write for Catalog HGB.

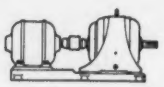
CONCENTRIC SHAFT DRIVES

- 554 Stock Combinations
- Capacities From 1 to 150 HP
- Output Torque to 100,000 lb. in.



Foot Mounted Straight Line

Foot Mounted Right Angle



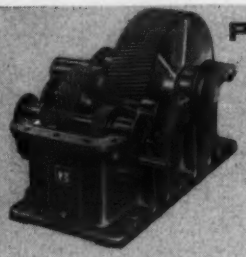
Base Mount

Flange Mounted Straight Line and Right Angle Types

Concentric Shaft Drives incorporate high hardness, premium quality Duti-Rated Lifetime Gearing to provide greater load carrying capacity and longer service life. Compact design takes less space per rated horsepower. Rated to AGMA Standards. Write for Engineering Manual LP No. 3.

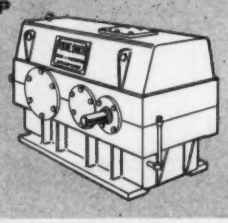
PARALLEL SHAFT DRIVES

- 62 Standard Sizes • 9 Shaft Arrangements
- Capacities to 1550 HP



Standard Housing

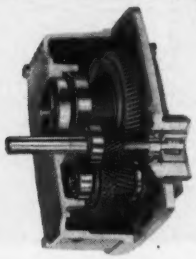
All Steel Housing



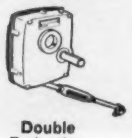
Foote Bros. Parallel Shaft Drives are designed for applications with heavy shock loads, high overhung loads—or installations requiring multiple output shafts. Ruggedly built to deliver trouble-free performance under most severe conditions. Rated to AGMA Standards. Write for Catalog MPB.

SHAFT MOUNTED DRIVES

- 45 Stock Combinations
- Capacities From ¼ to 40 HP
- Output Speeds: 9 to 420 RPM



Single Reduction



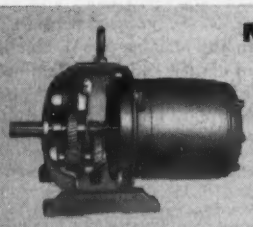
Double Reduction

Flange Mount

Duti-Rated Lifetime Gearing in Foote Bros. Shaft Mounted Drives transmits more horsepower—size-for-size than any other units to make them more economical, more efficient, in any application. Designed for quick, easy mounting. Rated to AGMA Standards. Write for Catalog SMB.

MOTORIZED DRIVES

- More than 3000 Stock Combinations
- Output Speeds From 7.5 to 780 RPM
- Capacities to 150 HP



Horizontal Gearmotor

Horizontal Line-O-Motor

Vertical Gearmotor

Vertical Line-O-Motor

Stronger, tougher Duti-Rated Gearing in Foote Bros. Motorized Drives guarantees smoother operation, longer life. Foote Bros.—Louis Allis Gearmotors available with any type of motor to meet your needs. Line-O-Motor Drives permit you to use any NEMA Frame motor. Rated to AGMA Standards. Write for Catalog MRA.

FOOTE BROS. GEAR AND MACHINE CORPORATION

POWER TRANSMISSION DRIVES 4555 South Western Boulevard, Chicago 9, Illinois

7764 on Reader Service Slip.

charging and thereby provides method for uniform sizing of batches. During operation, VS-20 automatically accelerates for drying and washing; it automatically decelerates for discharging.

Operating flexibility is obtained by automatic timers which control each step of cycle: duration of charging; washing, which is accomplished by spray nozzles; final dry spinning.

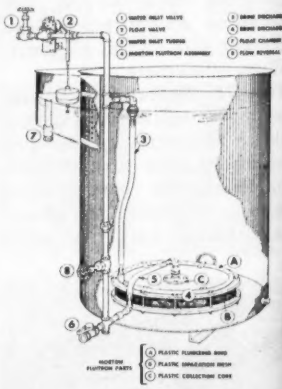
Supplier: Chemical Machinery Division of Baker Perkins, Inc., 1000 Hess, Saginaw, Michigan.

7765 on Reader Service Slip.

Makes up saturated brine continuously at 600 gph

Features: Make-up tanks for brine may be pumped intermittently at flow rates up to 15 gpm; may be pumped continuously at 10 gpm. Flow by gravity is 5 gpm from tanks to vessels that are approximately at same elevation. Gravity-feed to vessels at lower elevations is up to 7.5 gpm.

Tanks have an all-plastic



Fresh water enters through cut-off valve (1), controlled by float valve (2). It passes through plastic tubing (3) into fluidizing ring (A). Brine collects at collection core (C) and passes out of tank through tubing (5). Mesh (B) separates saturated brine and remaining salt

assembly which in addition to creating high brine make-up rates also eliminates need for

continued on page

Plants, Companies, Personalities

Scudder Food Products, Inc.

Los Angeles, has promoted Stanley Giroux to the newly created post of assistant general manager of the firm's Southern Div.

Pet Milk Company

St. Louis, has promoted three executives. Elected to new posts were Gordon Ellis as executive vice president and general manager of the Food Products Div.; William N. Harsha, Jr., vice president and assistant to the president and James A. Dodge, vice president-marketing, Food Products Div. Ellis' Food Products Div. handles all production, marketing and administrative activities related to the company's manufactured food products.

G. Ellis

General Foods Corporation

has elected as directors Herbert M. Cleaves and C. W. Cook, both of whom are executive vice presidents-operations. E. A. Sanstrom, manager of manufacturing and engineering at the Walter Baker operation (part of the Jell-O Division) in Dorchester, Mass., has been appointed to the newly created post of manager, manufacturing services. He is succeeded in his former post by R. Eugene Mohlie, formerly with GF's Post Division in Battle Creek, Mich.

National Dairy Products Corp.

has elected as director Dr. C. R. Roberts, a vice president of the company's Sealtest Foods Div. He has been closely identified with quality control of milk supplies and other programs for the betterment of the industry.

The slightest trace of lubricating oil, whatever its viscosity, is as deadly as poison in killing repeat sales of food products.

Oil contamination is a serious problem wherever compressed air is used for handling or processing foods — *unless* you have the proper compressor equipment engineered for oil-free operation by Ingersoll-Rand. The reputation of I-R compressors for reliability in heavy-duty service is unmatched on all types of jobs throughout the world.

Ingersoll-Rand builds the most complete line of equipment for oil-free compression of air or gas, including "NL" single- and double-acting reciprocating compressors, helical rotary Axi-compressors, and centrifugal compressors in a complete range of sizes. For more information, call your I-R engineering representative today. He can give valuable help on your job.

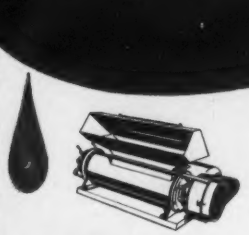
Ingersoll-Rand
129-A-14 11 Broadway, New York 4, N. Y.

THE WORLD'S MOST COMPREHENSIVE COMPRESSOR EXPERIENCE

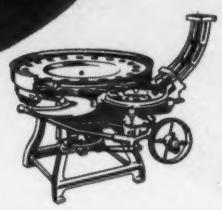
7766 on Reader Service Slip.

How FMC "matched set" equipment improves efficiency and profits in tomato processing

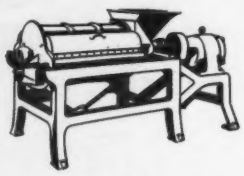
Any golfer knows that a matched set of clubs, tailored for him, will improve his game. The same thing happens when processors install "FMC matched equipment" for whole pack tomatoes, juice or other tomato products. Each highly-specialized piece complements the rest—in basic design, space requirements, construction, capacity, speed and ease of operation. Results: You increase product recovery, savings and efficiency all along the line. Most important, your pack will show the difference, in consistent quality and profits. Write for details or call your nearest FMC representative. Do it today.



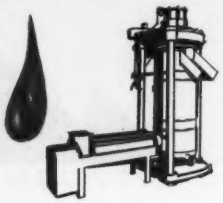
FMC TOMATO CHOPPER



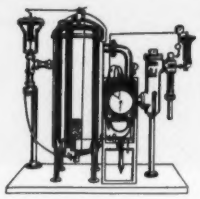
FMC HAND PACK FILLER



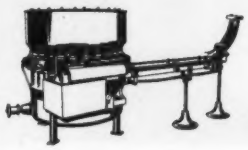
FMC PULPERS AND FINISHERS



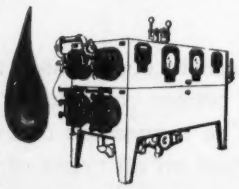
FMC VERTICAL SCREW PRESS



FMC DEAERATOR



FMC JUICE FILLERS



FMC JUICE PROCESSOR

FMC HIGH-PRESSURE TOMATO LINE

FMC JUICE EXTRACTOR

Other FMC Tomato Equipment Includes:

Flood Washers • Paste & Puree Fillers • Peeling & Inspection Tables • Heating Coils & Stainless Steel Tanks • "Sterilmatic" Continuous Pressure Cookers & Coolers • Scalders • Atmospheric Cookers & Coolers • Pre-Heaters

FOOD MACHINERY AND CHEMICAL CORPORATION

Putting Ideas to Work

FOOD MACHINERY AND CHEMICAL CORPORATION
Canning Machinery Division
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WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

7767 on Reader Service Slip.

control

continued from page 78

gravel supporting bed when high-purity, fine-grained salts are used.

Description: Plastic assembly, Fluitron—see (4) in photo above, circulates fresh water through lower salt bed, dissolving salt into brine. It also separates saturated brine from remaining salt and collects brine for discharge.

Assembly is available in either, Model E-S or Model E-P Brinemaker. Former is made of low carbon SS and has SS fittings.

Model E-P is made completely of translucent plastic. Light in weight, it has been approved by MID of USDA.

Either model takes an initial charge of one ton of salt.

Supplier: Morton Salt Company, 110 N. Wacker Drive, Chicago 6, Ill.

7768 on Reader Service Slip.

Full line of drying equipment, systems

Complete line of drying equipment and systems is described and illustrated in 16-page bulletin No. 448 issued by Proctor & Schwartz, Inc.

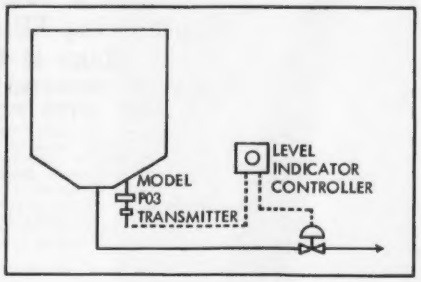
Included in the drying equipment, systems and accessories, are laboratory dryers, tray dryers, continuous drying systems, dryer feeds, spray drying systems, etc.

A special section, devoted exclusively to process equipment for the food industry, includes continuous conveyor dehydrators and continuous freezers.

Features of the line of equipment and systems are pointed out and many illustrations and diagrams are provided.

7769 on Reader Service Slip.

For more information on developments described here, use the convenient self-mailing Reader Service Slip.



To control amount of blending oil being drawn off, set-point on level indicator controller is lowered. When valve is opened, oil drains down to new level at which point, pneumatic signal automatically closes control valve

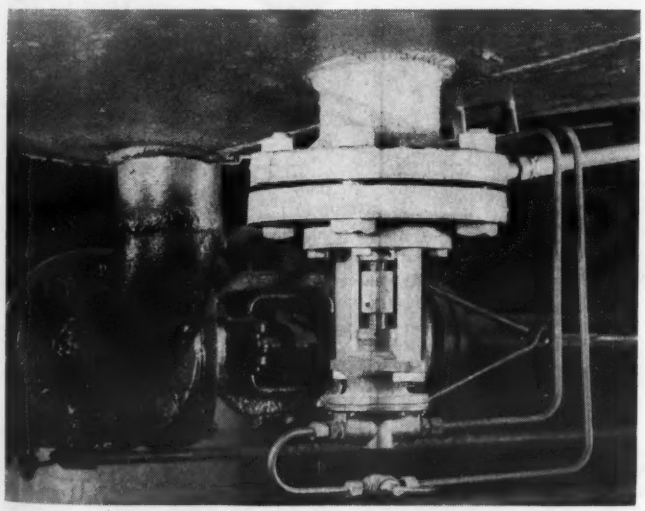
Double-diaphragm pressure transmitter is versatile, sanitary

Liquid level control can be mounted in 3 positions; has single, non-corrosive product-diaphragm for all ranges

Problem: In selecting instruments to measure levels or pressures of raw or processed soybean oil, engineering department of Humko Products, Champaign, Ill., lists three primary requirements.

Instruments must be able to handle relatively high viscosity, they must not be plugged by precipitating solids from oil and diaphragm must isolate oil from other components in a sanitary manner.

Solution: A transmitter, having product-diaphragm assembly completely separated from pneumatic pilot and diaphragm head, was found to be satisfactory. On Model P-03 Pressure and Liquid Level



Over 100 liquid level controls help automate oil processing. Transmitter on this vegetable oil blending stock tank is used to control amount being drawn off, see diagram and caption. Pressure transmitters can be installed vertically below tank as shown here, vertically above tank and horizontally on side of tank

NEW...STAINLESS STEEL AUTO-STOP LIQUID METER

It's here! *Automatic formula control* for the batching of corrosive liquids or liquids that must be kept free from contamination! It's the new Neptune Stainless Steel meter with all-stainless, Auto-Stop valve. The register watches the delivery, automatically trips the valve shut at the exact quantity. Valve is mechanically coupled...no inaccuracies due to time-lag in cut-off.

Saves time, ingredients, labor...puts end to spoiled batches...cleans up hazardous or messy conditions...provides accurate cost records. Accuracy is completely protected from effects of corrosion or corrosive wear. Only two moving parts in meter contact liquid. Gear train is outside the casing, isolated from liquid.

Size 1½", capacity 20 to 100 gpm. Also available with repeating Auto-Stop that "remembers" formula, and with ticket printing and electrical Auto-Switch combinations.

NEPTUNE METER COMPANY
Liquid Meter Division
47-25 34th St., Long Island City 1, N. Y.

neptune

Branches in: ATLANTA • BOSTON • CHICAGO • DALLAS
PORTLAND, ORE. • LONG ISLAND CITY • DENVER
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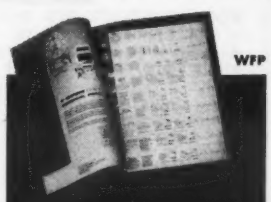
In Canada: Neptune Meters, Ltd., TORONTO 14, ONT.



ASK FOR BULLETIN 94/10.
Got a job in mind? Give details and we'll gladly give recommendations.

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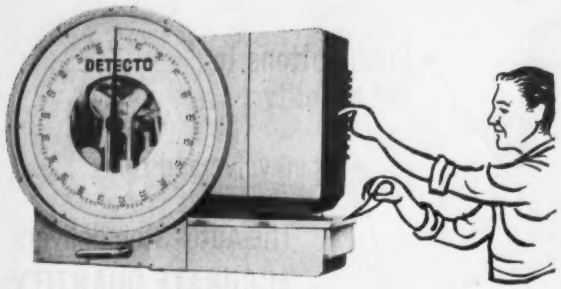

PUSH the button - manually or automatically...

PRINT the weight

DETECTO SCALES

do it speedily... accurately.

Find out how Detecto can streamline your plant operation. Write to . . .

DETECTO SCALES, INC.
Dept. K-6, 540 Park Ave., Brooklyn 5, N.Y.

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KOCH *White China Paint* **BLOCKS MOLD ON PAINT WITH BMM***

The enamel that is dependably damp-proof and mold-proof. Goes on damp walls, drives past moisture, and bonds securely. Once applied, it stays put because of absence of mold. Ideal for areas where foods are processed or stored, and for all interiors where dampness or high humidity might provoke growth of molds. Easily applied, with brush, roller, or spray. Washable. Won't chip, crack, craze, or peel. Dries to a semi-gloss texture that looks like white chinaware. USDA accepted.

* Barium Metaborate Monohydrate, Pat.

QUANTITIES NEEDED

1 gal. covers 400 to 500 sq. ft. Use primer on unsealed surfaces. Use 1 part thinner to 10 parts White China Paint.

MAIL COUPON TODAY!

KOCH SUPPLIES INC. 2520 Holmes St., Kansas City 8, Mo., U. S. A., Phone Victor 2-3788 TWX: KC 225

Rush my order for KOCH White China Mold Inhibiting Paint with a money-back guarantee if I am not completely satisfied

	Gals.	5 Gals.	Cost
White China Interior Enamel @ $8.35 gal.			
White China Interior Primer @ $6.85 gal.			
KOCH Odorless Thinner @ $2.00 gal.			

Note: White China in 5 gal. cans @ 35c per gal. discount

Name_____

Your Firm_____

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Transmitter, only connecting link between the two diaphragms is an adjustable stem, see photo page 81.

Consequently, product contamination and clogging of signal lines is prevented, even if pressure diaphragm should rupture.

Transmitter, made by Conoflow Corporation, 2100 Arch St., Philadelphia 3, Pa., contacts product at only one area, the product-pressure diaphragm which is made of Inconel X.

Instrument operates on simple force-balance system. Force exerted on pressure-measuring product diaphragm is balanced by an equal and opposite pneumatic force on air diaphragm.

By calibrating product-diaphragm area with pneumatic-diaphragm area, output air pressure becomes measure of loading pressure.

The two diaphragms are ratioed in order that air pressure output will always be within range of 3-15 psi for span selected, regardless of force measured. Scale or chart of receiver is calibrated in terms of loading pressure on product diaphragm.

Range is easily changed in field by varying effective area of pneumatic diaphragm. This is accomplished by changing diaphragm plates and backing rings. Product pressure diaphragm is identical for all ranges.

Results: For past year, transmitters have been performing in highly satisfactory manner and have required very little maintenance.

Ability to change range of transmitters without affecting process or liquid levels has been of particular advantage.

7773 on Reader Service Slip.

GET CURRENT LITERATURE

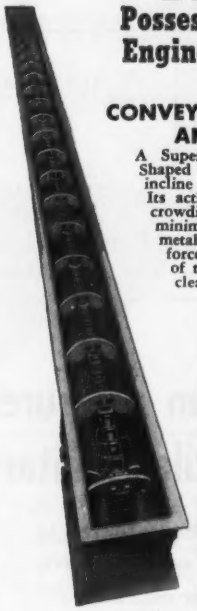
A quick reference to technical literature available this month is given in the classified listing of new literature, page 117 of this issue. Check it now.

Super-Flo TRADE MARK **CONVEYOR**

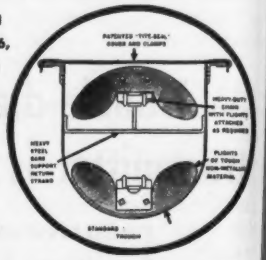
Possesses a Combination of Engineering Efficiencies That Make it Great!

CONVEYS SMOOTHLY — EFFORTLESSLY AND WITH POSITIVE PULL

A Super-Flo Conveyor operates within a single "U" Shaped Trough, handling material horizontally or up an incline without transferring to another conveyor. Its action is gentle despite its high capacity . . . no crowding, chopping or choking. Degradation is at a minimum. Works tirelessly! Flights are a special non-metallic, non-breakable material needing no reinforcement at the chain. Flights conform to contour of trough exerting a wiping action that keeps trough clean.



AVAILABLE IN 6, 9, 12, 14, 16, 18, 20 and 24 in. TROUGH WIDTHS — IN REGULAR OR HEAVY-DUTY STEEL, STAINLESS OR NON-FERROUS METALS



U.S. and Foreign Patents Pending.

Discharges at any required location, hand, rack and pinion or air operated. Trough is completely enclosed with "Hammond Tite-Seal" Cover and Clamps for easy access.

Write For Bulletin SF-659-A Today

Screw Conveyor Corporation
701 HOFFMAN STREET • HAMMOND, INDIANA
WINONA, MISSISSIPPI SANTA CLARA, CALIFORNIA

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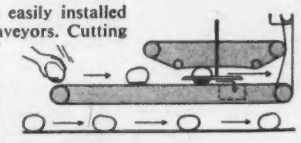
CUT TOMATO TRIMMING COSTS!

Remarkable **NEW** Automatic Tomato Trimmer

- **Cuts trimming costs more than half!** No hand trimming needed . . . you save up to 75% in labor costs.
- **Boosts production** . . . automatic trimming increases output many tons per hour.
- **Eliminates unnecessary product waste** . . . automatic trimmer pays for itself many times over.
- **Trims out black spots automatically.**

Tomato trimmer is easily installed on any existing conveyors. Cutting parts are made of stainless steel . . . the trimmer is easy to clean . . . easy to maintain.



Want more Details? Specifications? Prices? write:

F. H. LANGSENKAMP CO.
227 E. SOUTH ST. • INDIANAPOLIS 25, INDIANA

7775 on Reader Service Slip.

Mix and blend in shipping drums

Complete line of drum mixing equipment is described and illustrated in 12-page Bulletin DM-290. Three series of machines are presented: fibre-drum tumblers, steel-drum tumblers and adjustable drum rollers.

Five standard sizes of fibre drum tumblers are listed. New design features, such as quick-release drum holders, floor-level loading and built-in extenders, are presented in detail. Series of loading charts from which required size of drum tumbler may be determined is included.

Pertinent data on steel-drum tumblers and rollers is charted.

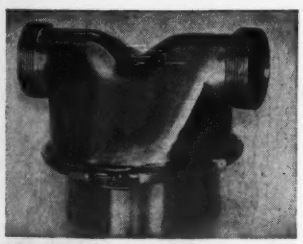
In addition, bulletin—available from Process Equipment Division of U. S. Stoneware Co.—contains illustrations and specifications of special units such as conical blender, Tumblemixer and "Rocker-Roll" drum mixer.

7776 on Reader Service Slip.

Traps loose metal in pipelines

Uses: For removing tramp iron. Trap can be used with high-viscosity liquids or slurries and is designed for low-pressure operation.

Features: Base plate contains non-electric, high-intensity magnet. Flow is directed across face of plate so that magnet



Ferrous particles in flow stream are attracted and held by magnet in circular base plate

attracts ferrous particles, yet does not obstruct flow.

Base plate, by means of quick-release clamp, can be quickly removed to facilitate

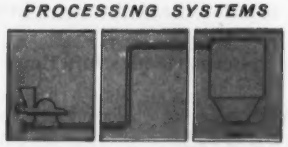
Continual expansion of the processing industries demands equipment designed and developed for *today*. Our MIKRO-BUD is an example of this type of planning. Recent changes in this vertical hammer mill were dictated by field tests on a variety of materials including cocoa, rubber accelerators, sodium sulphate, sugar, phenolic resins, dyes, colors and tobacco. Capacities have been stepped up from 40 to 100 per cent, depending on the material in process. Efficient air flow has added to the range of heat-sensitive materials handled without coolants. A selector control wheel allows adjustment over a wide range of particle sizes without shutting down the mill. Write for Bulletin 51-C-1.

The MIKRO-BUD is one of four different designs and 12 sizes of Mikro pulverizing equipment offering grinds from granular to the lower micron ranges, and capacities up to 20,000 lbs/hr on certain materials.

MIKRO-Products
PULVERIZING MACHINERY
63 Chatham Rd., Summit, N. J.
A Division of Metals Disintegrating Company
Division of American-Marietta Company

SPAN THE GLOBE

PROCESSING SYSTEMS



GRINDING CONVEYING COLLECTING

REPRESENTATIVES throughout the United States, Continental Europe, British Isles, Canada, Mexico, Central and South America, West Indies, South Africa, India, Japan, Philippines, Australia and New Zealand.
MANUFACTURING FACILITIES: United States, Canada, Continental Europe, British Isles.

7777 on Reader Service Slip.

cleaning and inspection.

Description: Magnetic trap is made in bronze and stainless steel. Castings are polished to satin-finish for sanitary purposes and corrosion resistance.

Made in four sizes, trap fits pipe ranging in diameter from 1½ to 3 in.

Supplier: Cesco, 4025 Sebastapol Highway, Santa Rosa, Calif.

7779 on Reader Service Slip.

Packaged CO_2 generators from 50 to 500 lb/hr

Systems for manufacturing carbon dioxide are completely assembled, piped, wired and pre-tested. Requiring about 8 ft by 20 ft of floor space for the average system, they are designed to burn natural gas or diesel oil.

Packaged units are made in standard capacities from 50 to 500 lb/hr and as custom-built plants from 1000 to 5000 lb/hr. Carbon dioxide is liquified in systems at 220 to 250 psi.

Automatic manufacturing systems, available from Louis De Markus Corporation, are fully described in six-page bulletin containing colored flow diagram. Literature presents several illustrations of units and discusses their features. Details on availability of an engineering cost study are included.

7780 on Reader Service Slip.

With clean, efficient clear-span interiors... An exclusive 20-year optional roof guarantee...

Factory-insulated Monopanl® walls in color... Colorful Butlerib™ for non-insulated areas and roof...

...and the widest range of sizes and styles available

Butler processing plants are years ahead in pre-engineered quality!

Poultry, packaged foods, soft drinks – whatever you produce – a Butler building makes an ideal processing plant. To begin with, your basic building is practically pre-planned for you. Butler rigid frames provide full structural support – eliminate costly load-bearing walls – and utilize attractive, economical curtain wall systems. Inside, you have a post-free, truss-free production area that is ideally suited for straight-line processing and overhead handling.

The Butler System provides America's most advanced pre-engineered building. You save valuable engineering and construction time all through the building process, start producing weeks to months sooner. And only Butler offers an optional 20-year roof guarantee, *two* superior exterior wall systems, and the most beautiful and durable color finishes yet developed for pre-engineered panels.

Your local Butler builder provides a complete construction service, including financing. Call him soon for an estimate. Or write direct.

"See Sweet's Industrial Construction File – Section 8-D"

MBMA METAL BUILDING MANUFACTURERS ASSOCIATION

BUTLER

BUTLER MANUFACTURING COMPANY

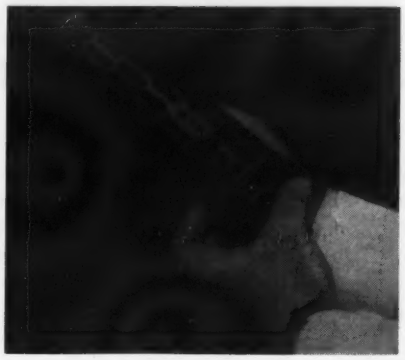
7479 East 13th Street, Kansas City 26, Missouri

Manufacturers of Metal Buildings • Plastic Panels • Equipment for Farming, Transportation, Bulk Handling, Outdoor Advertising • Contract Manufacturing

Sales offices in Los Angeles and Richmond, Calif. • Houston, Tex. • Birmingham, Ala. • Kansas City, Mo. • Minneapolis, Minn. • Chicago, Ill. • Detroit, Mich. Cleveland, Ohio • New York City and Syracuse, N.Y. • Washington, D. C. • Burlington, Ontario, Canada

7778 on Reader Service Slip.

"Johnson, I've been receiving reports that you have been hot-rodding your fork truck around the plant."



Filter element consists of stainless steel ribbon wound into cylinder, much like a compressed coil spring. Flow is from outside, through spacings between helix, to inside

Pipeline filters double production

- **cut cleaning frequency by 2/3**
- **cut cleaning time by 1/3**
- **release needed floor space**

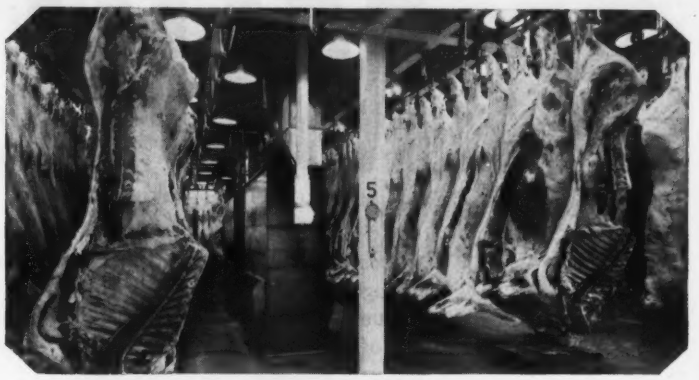
Problem: To eliminate foreign particles from melted chewing gum base which are not removed by centrifuging, American Chicle Company had used a filter press. However, manual labor required for its operation was excessive.

Solution: Particles are now excluded by passing gum base through fine screens (0.005 in.). Five of these screens are mounted in pipelines where they can be cleaned without disassembly.

Screen filters installed are metal edge filters, manufac-

Filters are kept clean by rotating filter element against knife blade for 20 minutes every three hours. Sump is cleaned periodically by blowing it out

NIAGARA "no frost"



FULLY AUTOMATIC REFRIGERATION

Fresh Beef Chilling

● Niagara No-Frost completely eliminates the frost problem of dry coils and the corrosion problem of brine systems. Now in fresh meat chill rooms as well as holding and shipping coolers, in provision holding and packaging and in all MEAT FREEZING Niagara No-Frost is giving users the lowest costs and best quality in the industry. Inspect the No-Frost plant nearest you.

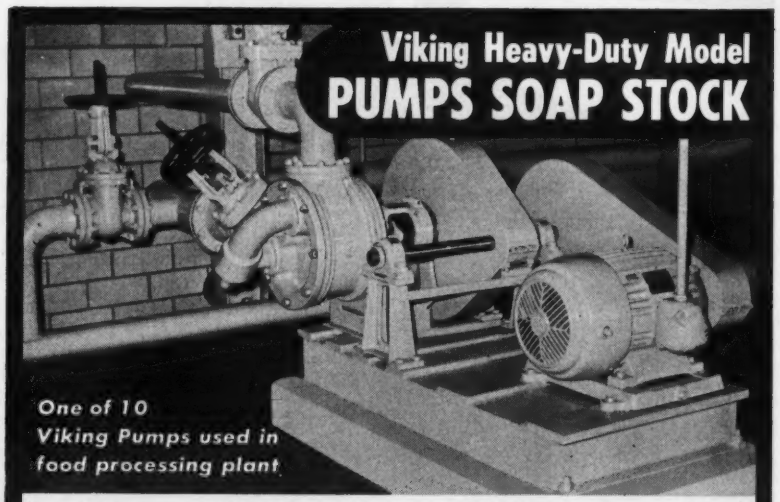
Write for Bulletin No. 105

NIAGARA BLOWER COMPANY

Dept. FP-7, 405 Lexington Ave., New York 17, N. Y.

District Engineers in Principal Cities

7781 on Reader Service Slip.



Anderson, Clayton & Co. Foods Division, processes Mrs. Tucker's vegetable oil products in its Texas plant. Soap stock is a by-product. As the material has a viscosity of 128,000 SSU, an "M" size heavy-duty, steel fitted Viking Pump is required to move the thick, viscous stock to storage tanks, tank cars and trucks. Plant management states they are well pleased with this pump and the nine other Viking pump units they use in various stages of processing vegetable oils.

Viking Pumps are famous for pumping thick liquids and semi-solids in the food processing, chemical processing and petroleum industries. If you have a thick liquid to pump, Viking will be glad to draw on its wealth of experience to help you solve it. For information, write for Catalogs CEP and MEP.

VIKING PUMP COMPANY

Cedar Falls, Iowa, U.S.A. In Canada, It's "ROTO-KING" Pumps

See Our Catalog In Sweet's Plant Engineer's File

7782 on Reader Service Slip.

MOS

NEW SYSTEMS TECHNIQUE PROVIDES CURRENT DATA TO CONTROL YOUR MANUFACTURING CYCLE... MAKES YOUR OPERATION MORE EFFICIENT, WITH FASTER RESPONSE TO CHANGES

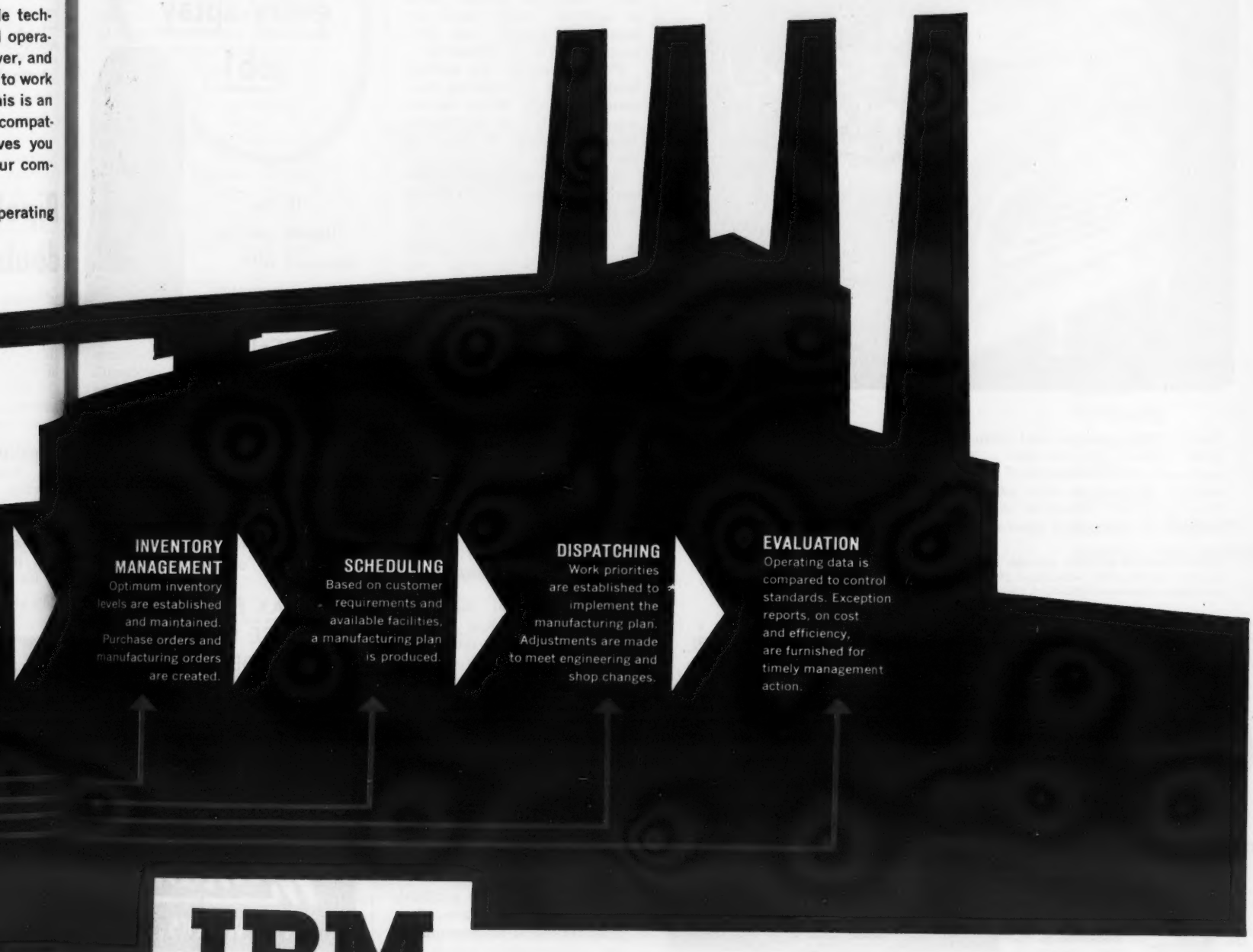
IBM MANAGEMENT OPERATING SYSTEM

To coordinate planning and control functions continuously throughout the manufacturing cycle IBM has developed a unique Management Operating System. This system makes use of existing IBM data processing equipment, proved in thousands of industrial installations.

WHAT IS THE IBM MANAGEMENT OPERATING SYSTEM?
MOS is a data processing technique that provides the information needed to control your manufacturing cycle. It is designed to handle automatically the decision data required to carry out related functions, from planning and operations control to evaluation. It provides accurate data on a continuing basis . . . in time for effective management decisions.

WHO CAN USE MOS?
The IBM Management Operating System is a flexible technique that can be applied to most types of industrial operations. Every manufacturing operation is unique, however, and IBM manufacturing representatives have been trained to work with you to adapt the basic concepts to your needs. This is an important aspect of IBM Balanced Data Processing—compatible equipment backed by complete services. It gives you comprehensive support in applying the system to your company's operation.

For full information about the IBM Management Operating System, contact your local IBM office.


INVENTORY MANAGEMENT
Optimum inventory levels are established and maintained. Purchase orders and manufacturing orders are created.
SCHEDULING
Based on customer requirements and available facilities, a manufacturing plan is produced.
DISPATCHING
Work priorities are established to implement the manufacturing plan. Adjustments are made to meet engineering and shop changes.
EVALUATION
Operating data is compared to control standards. Exception reports, on cost and efficiency, are furnished for timely management action.

IBM®

BALANCED DATA PROCESSING

7783 on Reader Service Slip.

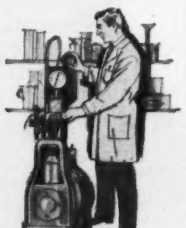
Gaulin Homogenizers
Plus G.T.A.*
Unlock the Secret to Cost Savings in Blending, Dispersing or Emulsifying

Gaulin Homogenizers and Dispersers reduce ingredients down to their ultimate particle size . . . disperse them evenly. They make uniformly finer emulsions of maximum stability. Also produce fine uniform dispersions with exceptionally low rise in temperature. They give you control of particle size and viscosity . . . improve texture . . . stop color separation.

**Gaulin Technical Assistance* provides free technical data, experienced advice and laboratory analysis. Take advantage of G.T.A. Write for bulletins: Homogenizers H-55, Sub-Micron Dispersers SMD-55, Colloid Mills C-57.*

GTA Bulletins

Technical Assistance


Laboratory Analysis

Try Particle Control in Your Plant . . . Rent a Gaulin Laboratory Homogenizer for Only $75.00 Per Month! This versatile machine reduces ingredients in your product to ultimate particle size. Minimum sample one pint; Capacity 15 GPH; Pressures up to 8000 psi. Rental costs applicable against purchase price. Write for Bulletin LH-55.

Gaulin TRADE MARK
MANTON
Gaulin
MANUFACTURING CO., INC. EVERETT, MASS.

59 Garden Street **Everett 49, Mass.**

World's largest manufacturer of stainless steel reciprocating, rotary, pressure exchange pumps; dispersers, homogenizers and colloid mills.

7784 on Reader Service Slip.

tured by Purolator Products, Inc. of Rahway, N.J. They are similar in appearance to vertical pipeline strainers.

Screens, or filter elements, consist of 304 stainless steel ribbon wound into one-piece cylinder, see page 85. Ribbon is trapezoidal in cross section with smaller edge toward inside. Integrally spaced risers of uniform height hold adjacent wires apart, thus governing degree of filtration.

Filter assembly has spring-loaded knife for cleaning filter element. Knife bears against outside of element as it is rotated, scraping it clean of built-up dirt.

At American Chicle Company, rotation of filter element is motorized.

Results: Filters require only 20 minutes cleaning every three hours; with press, lines were shut down every hour and cleaning required 30 minutes.

According to A. Novissimo, processing superintendent: ". . . filters are much smaller and easier to handle. There wouldn't be room on the platform to process current requirements if the old filter press was still being used."

7785 on Reader Service Slip.

Replaces pipe coils for heating, cooling

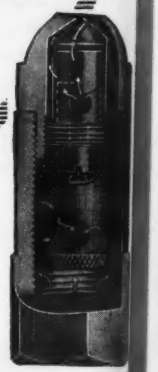
An economical means of heating and cooling without old-style pipe coils and heavy integral jacketing is covered in 2-page "Dean Panelcoil" Bulletin M-8.

Panelcoils are made to two metal sheets. Either both, or at least one of the sheets contains embossed channels. When metal sheets are seam welded together, the embossings form flow channels for steam, water, oil, refrigerant, or any other medium which might be used for heating or cooling.

Bulletin, which is available from Dean Products, Inc., gives technical information on the advantages, styles and typical applications where Panelcoil can be used. It contains numerous illustrations of actual applications.

7786 on Reader Service Slip.

There's a *Monarch* nozzle for every spray job!



If the liquid can be sprayed with direct-pressure rely on MONARCH advanced design NOZZLES

For a perfect spray, many food processing plants prefer Monarch Nozzles.

Monarch's advanced design reduces clogging and guarantees dependable applications to . . .

- ★ WAX FRUITS
- ★ RINSE VEGETABLES
- ★ POWDER MILK
- ★ DRY EGGS
- ★ WASH FILTER CAKE
- ★ HUMIDIFY BANANA ROOMS

Send for Catalog 1

Monarch
MFG. WORKS, INC.
3401 GAUL STREET
PHILADELPHIA 34, PA.

7787 on Reader Service Slip.

Centrifugal, counter-current liquid-liquid extraction

Extractor incorporates either two or three mixing and separating stages within single bowl. Bowl revolves at high speed and course of flow in each stage is centripetal.

Flow of liquid containing valuable constituent and flow of liquid containing solvent is counter current; that is, heavy liquid flows from bottom up, lighter liquid from top down.

Liquid under extraction is is thoroughly mixed with solvent-containing liquid prior to flowing into each separating stage. Built-in distributers ensure uniform feed of mixed liquids to series of connected separating chambers without disturbing interface.

Full explanation of principle of operation, aided by four-color flow diagrams, is offered in eight-page bulletin, available from Centrico, Inc. Complete line of extractors, which are especially suitable for complex extraction operations, is described and illustrated.

Also presented in Bulletin 2567 are performance curves, and tabulated data on extraction yields and technical data.

7788 on Reader Service Slip.

VOTE FOR YOUR FAVORITE CARTOON

See this month's "FP Hall of Fame Cartoon" on page 118, and then vote for large reproduction of your favorite on the Reader Service Slip.

Give your product slices the *"beauty treatment"* with the Urschel high speed Model "OV" TRANSVERSE SLICER

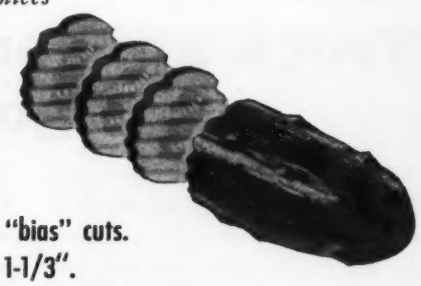
Urschel Model "OV" Slicer

Clean, uniform, better-than-ever cross-cuts on

PICKLES
CARROTS
CELERY
RHUBARB
BROCCOLI
OKRA
SQUASH
BAMBOO SHOOTS
WATER CHESTNUTS

Plain Slices

Corrugated Slices



OPERATING PRINCIPLE

The product to be cut is dropped into a hopper through which it feeds onto two high speed conveyor belts, each sloping inwardly to form a "V" cross-section. • A third conveyor belt then comes down over the top to complete the product enclosure. • Thus, the product enters the slicing wheel completely surrounded by moving conveyor belts and slicing wheel corrugated rolls which insures its positive feed into the knives. • This action virtually eliminates plugging of the machine, and, since the feed to the knives is positive, "thin" slices occur infrequently. • The new unit is so positive in its feeding action that it will feed leafy products easily. • The "V" shape formed by the belts keeps the product in constant alignment with the cutting knives regardless of product diameter, practically eliminating "bias" cuts.

- ***Positive*** **feed action.**
- **No product crushing.**
- **Practically eliminates "thin" or "bias" cuts.**
- **Cuts thicknesses from 1/16" to 1-1/3".**
- **High capacity feeding with maximum cutting yield.**
- **Compact—engineered for long dependable service and low maintenance.**

PRECISION HIGH-SPEED FOOD CUTTING EQUIPMENT

URSCHEL LABORATORIES INC.
VALPARAISO, INDIANA

Designers and manufacturers of precision, high speed cutting equipment for food products

7789 on Reader Service Slip.

Drewrys takes pride in the appearance as well as the performance of its Mack fleet. B-61ST models haul GCW loads of 72,000 lbs. on high-speed toll-road runs.

At Drewrys

Truck appearance, too, is good for business

MACK for over 7 straight years NO.1 by far in sales of diesel trucks

"We not only count on our trucks for top-notch performance, but use them to help create a favorable impression for our product with customers and prospective customers," says an executive of Drewrys Ltd., U.S.A., Incorporated, of South Bend, Indiana. "Macks' rugged, honest, businesslike appearance and outstanding performance record fit the bill exactly."

And there's a big dollar reason, too, behind Drewrys' choice of Macks. Says Fleet Manager K. W. Riffel, "Ours is an 'arrive—unload—load—and on the road again' type of operation. We're expanding territories . . . and at the same time trying to keep costs down. Our Mack trucks supply the dependability needed to maintain schedules day after day and still give us maximum fuel and maintenance economy. After more than 150,000 miles per unit, we are averaging 6.5 to 7 mpg with maintenance of only one cent per mile, including oil and filters."

Drewrys' profitable experience with Macks is right in line with similar reports from all over the country, and results from the different way in which Macks are built. A Mack truck is a quality vehicle. It is not just Mack-assembled—it's Mack-*built*. Mack manufactures its own engines, axles, transmissions, cabs, and other components. Every vital part is built by Mack for Mack trucks alone . . . Mack quality features consistently produce superior performance and balance-sheet savings. So why not put Macks to work in your operation? Your Mack branch or distributor is the man to see. Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario.

7724

MACK
FIRST NAME FOR
TRUCKS

Plants, Companies, Personalities

American Maize-Products Co.

Hammond, Ind., has elected as a director Dr. James W. Evans, vice president-research. Dr. Evans is president-elect of the American Assn. of Cereal Chemists.

Ore-Ida Frozen Food Products, Inc.

Ontario, Ore., is building a new $2 million plant at Burley, Idaho. Expected to be completed in time to start processing this fall's crop of Idaho potatoes, the plant will double Ore-Ida's capacity, enabling the company to handle 2,000,000 lb of raw product daily. The company also announces promotion of Robert Ryan, Jr., to production manager at the Ontario, Ore., plant.

Salada-Shirriff-Horsey

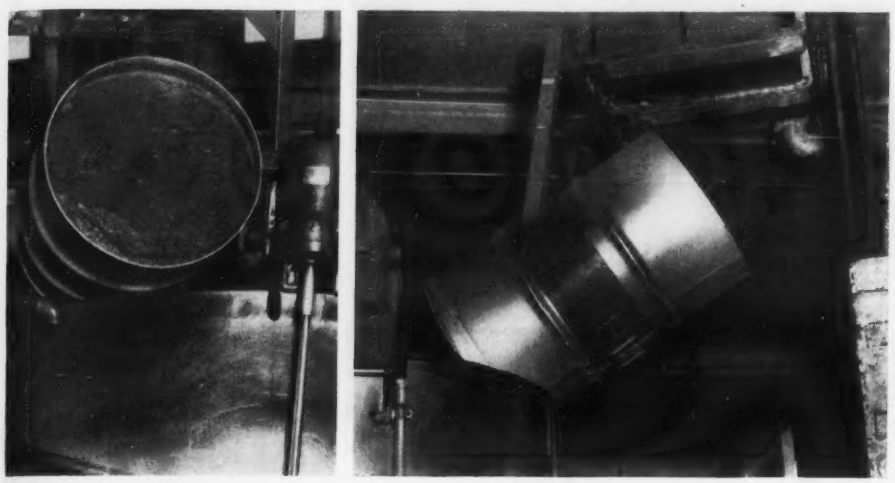
Toronto, has appointed W. D. Shirriff, formerly a division general manager, to director of new products development. He will continue to supervise the company's research and development center at Little Falls, N.Y.

Continental Can Company

is building a General Packaging Research and Development Center adjacent to the company's Metal Research and Development Building in Chicago. Scheduled for 1961 opening, the 145,000-sq-ft structure will house the newly established General Packaging R&D Division, which will do research on improvement of containers derived from paper, plastics and combinations of the two, and on closures for glass and other containers.

For more information on product at left, circle 7790 see information request blank opposite last page.

Opened 55-gal drum of tomato concentrate is shown at left just before contents are dumped into mixing vat; at right in process of being emptied while suspended from fork truck's special drum-handling jig



By receiving tomato concentrate for remanufacture in 55-gal 'Sterilpac' drums instead of in No. 10 cans, processor of Italian specialties . . .

Cuts costs, ups efficiency — yet maintains product quality

WALTER FERRIS, Plant Manager
Gioia Specialty Foods, Inc.
as told to **NORB LEINEN**

PROBLEM: When Gioia Specialty Foods, Inc., Odessa, Del., began operations in 1958 as a subsidiary of 50-yr-old Gioia Macaroni Co., Inc., Buffalo, N.Y., several characteristics made cost reduction especially important.

These included — in addition to plant's newness — its small size (30,000 sq ft; less than 60 employees), year 'round operation, diversified lines (with emphasis on Italian recipes), quality reputation and a unique operating plan that calls for manufacture of specific orders, instead of for inventory.

Reason for latter is that Gioia believes that Italian items should be manufactured, packaged, distributed and delivered to the consumer while the bloom is on all seasoning—a period felt at its best within six to eight months after processing.

Solution: Tomato concentrate, as one of the principal semi-finished food products going into all recipes — pizza sauce, spaghetti sauce, ravioli, Spanish rice, chicken cacciatore, canned spaghetti; and canned macaroni products in Italian sauce — was a natural prospect for cost reduction.

To accomplish this objective, without compromising quality, Gioia adopted delivery of tomato concentrate from Flotill Products, Inc. of Stockton, Calif., in 55-gal Rheem "Sterilpac" drums (FP, Aug. 1958, "Breakthrough in Bulk Canning").

In-plant handling of the aseptically packed, vacuum-sealed drums of tomato concentrate is by means of a lift truck equipped with a drum-handling yoke.

After the Sterilpac drum's top is removed — in less than two min — by a motor-driven drum opener, a steel yoke is clamped around mid-section of drum. Brackets for the fork prongs are connected to the yoke.

By inserting lift truck forks into the

How SANDVIK
Steel-Belt
CONVEYORS
Lower Vegetable Processing
And Freezing Costs

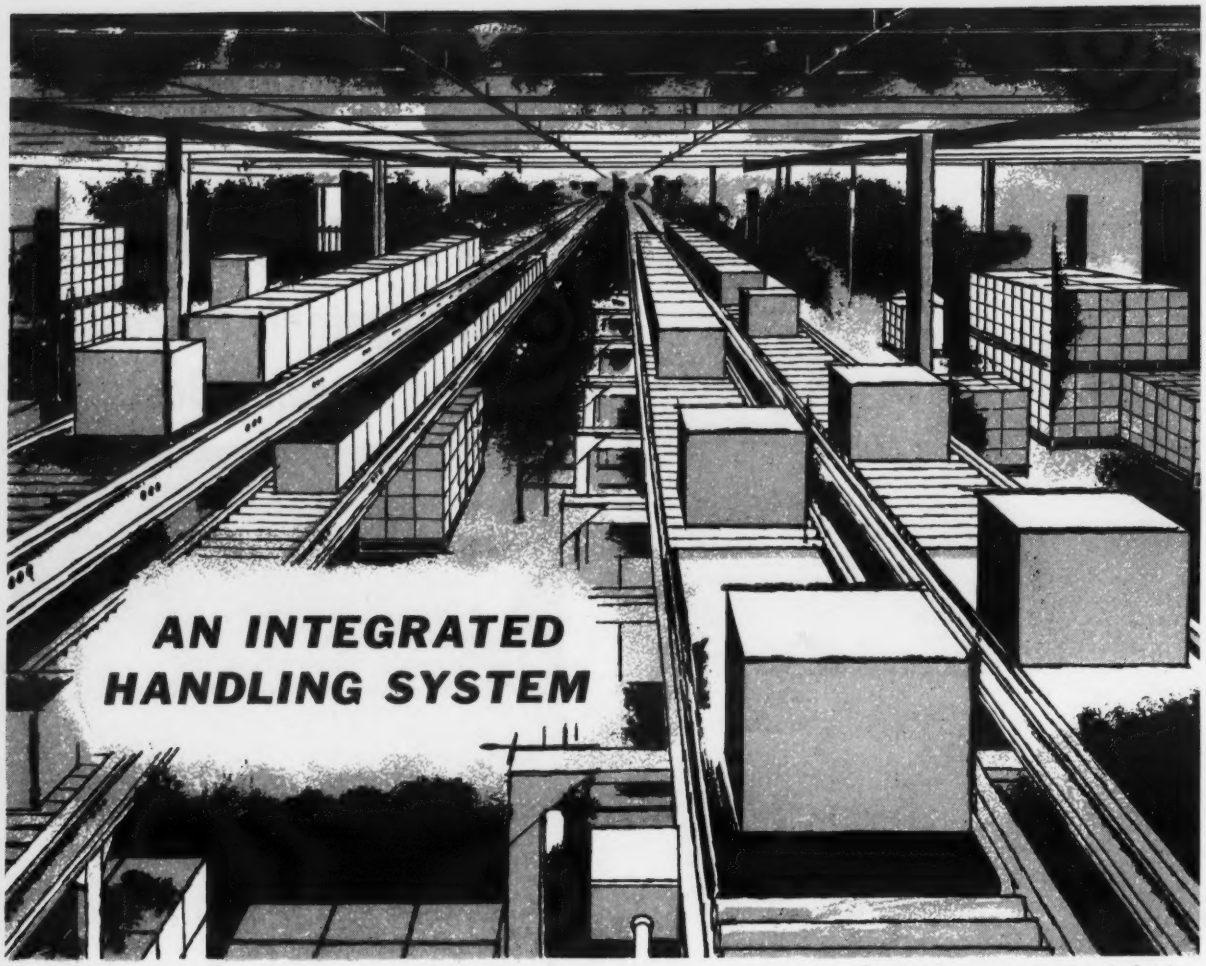
Solid belts have proven advantageous for sorting and inspection and in freezing many vegetables and by-products.
Perforated belts have the advantages of a smooth steel belt plus increased air circulation for quick, complete freezing. Perforations can be sized and shaped to suit application.

- With solid or perforated belts of stainless steel—Any length or width
- Product separates easily from smooth belt surface. Breakage eliminated
- No stretch—no maintenance—Sandvik "Tru-Track" design assures permanent alignment
- Unaffected by vegetable acids, water, other corrosives
- Easy cleanability; impermeable surface simplifies bacteria count control—prevents taste contamination
- Permanent strength, high load capacity, long life

Three Sandvik belts are used in this potato specking table at Nittany Packing Co., Center Hall, Penn. Peeled potatoes load on side belts. Cleaned potatoes leave table on center belt after removal of eyes and buds. Side belts also discharge waste.

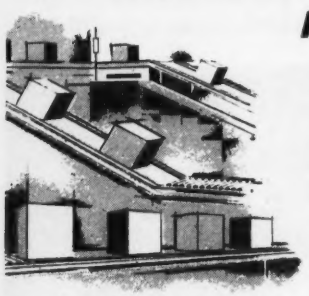
SANDVIK STEEL, INC.
STEEL BELT CONVEYOR DEPT.
1702 Nevins Rd., Fair Lawn, N. J., SW 7-6200
Cleveland • Detroit • Chicago • Los Angeles
IN CANADA: Sandvik Canadian Ltd., P. O. Dr. 1335, Sta. O., Montreal 9, P. Q.
MANUFACTURERS OF STEEL BELT CONVEYORS FOR OVER 40 YEARS
SS 217

7791 on Reader Service Slip.



Overhead conveyor system in food processing plant saves thousands of square feet of floor space.

...Engineered by ALVEY...



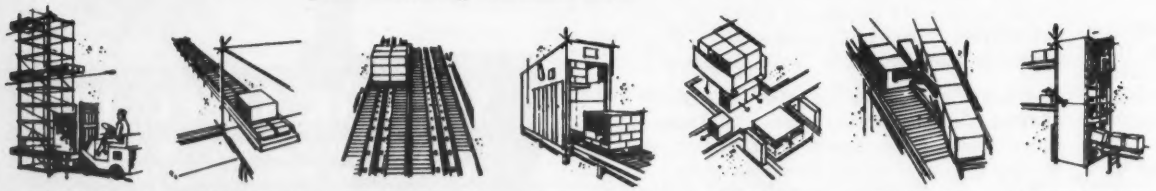
May Cut Your Package Handling Costs

It doesn't pay to buy conveyors piecemeal. You don't have to throw away your present equipment and start from scratch, either.

Alvey's experienced package handling engineers can show you how to coordinate the workable parts of your present system with new elements for faster, easier, less expensive materials handling.

Or, they can build a complete system for a new plant, or total modernization program.

Remember, it's often more profitable to cut processing and handling costs than to make new sales. Call in Alvey, and reappraise your handling methods now.



Vertical Lift Conveyors | Telescopic Boom Conveyors | Air-Chain Conveyors | Pallet Loaders | De-Palletizers | Traffic Cop | Vertical Indexing Conveyors

ALVEY CONVEYOR MANUFACTURING COMPANY

9307 Olive Street Road, St. Louis 32, Mo. • *Branch Offices in Principal Cities*

7792 on Reader Service Slip.

brackets, the open drum then is transported to a stainless-steel mixing vat— for compounding the tomato concentrate with ingredients, or to one of the cooking vats, depending on requirements of producing the recipe.

Dumping is accomplished by positioning the drum vertically and moving the lift truck forward. Drum then is manually tilted using a tilting bar.

Following dumping, drum is thoroughly rinsed of all remaining product by means of a hose and nozzle.

Results: In the first months of operation, Gioia has made a saving of 27 per cent in labor costs, in opening and preparing the mix of tomato concentrate.

Upon arrival at processing plant, 580-lb drum of tomato concentrate is easily hoisted by its swedges and transported to storage area

Instead of opening 75 No. 10 cans for the same quantity of concentrate, Gioia now opens one 55-gal drum in a fraction of the time previously needed.

Moreover, whereas previously production often would outrun the speed of opening No. 10 cans and preparing the concentrate for process use, the Sterilpac drum operation now is able to keep ahead of other production processes. No production time now is lost in waiting for the semi-finished concentrate.

In contrast to previous loss of product, where an estimated one-oz of product was left in each No. 10 can, each Sterilpac drum has product completely removed by rinsing out using hose and nozzle.

Thus, in a comparable quan-

continued on page 94

Plants, Companies, Personalities

Seabrook Farms

a subsidiary of Seeman Brothers, Inc., has promoted two veteran executives. William J. Scheffer has been named vice president for manufacturing, and Ernest H. Brothers is the new vice president in charge of agricultural operations.

Frank Armour Jr.

president of H. J. Heinz Company, was presented with the annual award for industrial leadership by Duquesne University Chapter of the Society for the Advancement of Management.

Western Condensing Co.

Appleton, Wis., Division of Foremost Dairies, has appointed Arthur J. Nielsen to the company's Technical Service Staff. He will work as technical consultant to food manufacturers concerning Western's milk products and milk fractions.

The Borden Company

has acquired Brandywine Mushroom Corp., West Chester, Pa., one of the nation's largest grower-processors of cultivated mushrooms. The firm will operate under supervision of the Borden Foods Company division.

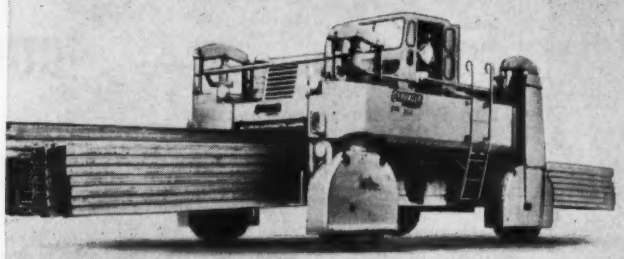
The Pillsbury Company

has appointed Roy Shaw, a specialist in potato research, as manager of dried food product development. He had been assistant to the director of research and development for J. R. Simplot Company.

For more information on product at right, circle 7793 see information request blank opposite last page.

TOWMOTOR-GERLINGER

offers you three complete capital-saving services!



1 YOU LEASE *without down payment!*

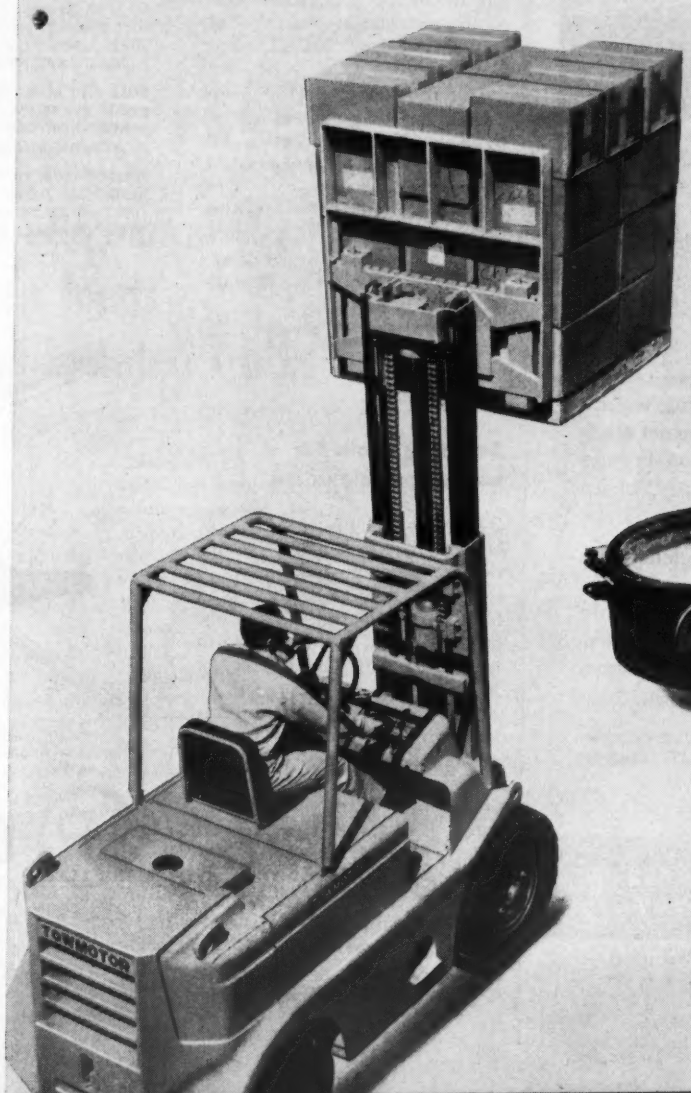
You don't make a *down payment* when you use the Towmotor-Gerlinger Lease-A-Truck Plan. You put T-G equipment to work on a continuous, year-'round basis. You just make a small monthly payment—paid out of savings the equipment produces.

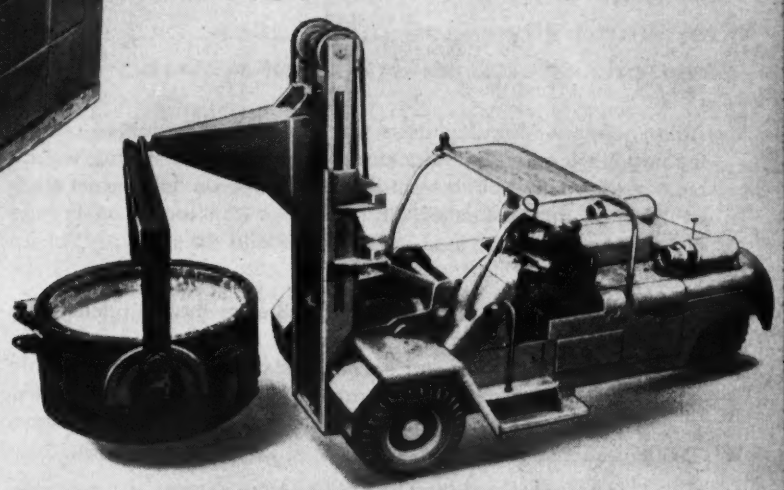
2 YOU RENT *without cash outlay!*

You don't tie up working capital when you *rent* Towmotor-Gerlinger fork lift trucks and material carriers. You put them to work immediately. You start cutting handling costs immediately. Your only cash outlay is one small monthly charge.

3 YOU BUY *and save as you pay!*

You don't pay cash for Towmotor-Gerlinger equipment when you use our low-cost Time Payment Plan. You make reasonable monthly payments. Low interest rates make it easy. Handling economies consistently pay the monthly cost many times over.





Complete factory-supervised maintenance can be included in *any* of the above plans! For complete information, write Towmotor-Gerlinger Rental Division, Towmotor Corporation, Cleveland 10, Ohio.

TOWMOTOR -GERLINGER®
THE ONE-MAN-GANG

FORK LIFT TRUCKS, CARRIERS AND TRACTORS SINCE 1919

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation

continued from page 92

tity of concentrate, use of Sterilpac has produced a saving of 75 oz for each 55 gallons of concentrate used.

Freight costs also are reduced by Gioia, using Sterilpac drums instead of No. 10 cans. In a typical incoming car of tomato paste in drums, total weight is 4300 lb less than a car of the same amount of concentrate in cans.

Additional savings are realized in disposition of the drum. Previously, it had been necessary to hire a cartage contractor to haul away the cartons of No. 10 cans.

Currently, the used, empty drums are sold for an average $1.75 each — equivalent to 13.2 cents per case of cans, as actual income, in contrast to a former item of expense.

Suppliers: "Sterilpac" 55-gal drum by Container Div. of Rheem Manufacturing Co., 1701 W. Edgar Rd., Linden, New Jersey.

7795 on Reader Service Slip.

Sterilpac drum-opening tool by Krist Machine Works, 731 S. Second St., Milwaukee 4, Wisconsin.

7796 on Reader Service Slip.

Drum-handling yoke attachment for fork trucks by Sterling, Fleischmann Co., Broomall, Pennsylvania.

7797 on Reader Service Slip.

Selecting chain for conveying, elevating

Correct application of chains to conveyor systems, development of attachments to increase their versatility and factors in selecting chains are outlined and illustrated in new reference handbook of Moline Malleable Iron Co.

Comparison charts containing principal features of the most popular types of chains, and graphs of friction coefficients and other data correlated provide a concise reference for the design engineer.

Installation tips, maintenance pointers and a trouble-shooting chart also are included.

7798 on Reader Service Slip.

ALLIS-CHALMERS TAKES A LACING - TO IMPROVE PRODUCT QUALITY

Selects CLIPPER Hooks and Lacers for durability, easy installation, and smooth operation on small rollers

Allis-Chalmers Manufacturing Company of Milwaukee, one of the nation's leading manufacturers of farm machinery and equipment receives multiple benefits and improvement in product quality by their application of Clipper hooks and lacers on Forage Blower and Harvester feed table aprons and draper type pick-up belts.

They find in the Forage Harvester and Blower that Clipper lacing makes possible use of protective shields against the draper. On all applications drapers are easier to install, run more smoothly on small rolls and are more durable. The material laced is two-ply rubberized material from 15½ to 35¾ inches wide and from .060 to .090 inches thick.

For more information— *Detailed product information and case history examples of Clipper machine-lacing benefits are contained in Bulletin No. 157. Send for your free copy today.*

Ask your Industrial Distributor for Clipper Products

Clipper BELT LACER COMPANY

972 Front Ave., N. W., Grand Rapids 2, Michigan

7794 on Reader Service Slip.

HOLZ

RUBBER CONVEYOR CLEATS

INSTALL IN A JIFFY . . FOR LOW-COST SERVICE!

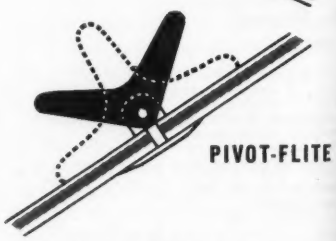
A few minutes, a punch and a screwdriver—are all you need to install efficient rubber lift-cleats for your conveyor system. Install them without removing the belt! There's a style for your particular need, too!

HOLZ Bolta-Flite cleats bolt solidly to chain, fabric or metal systems, for long term **heavy-duty** lifting power at minimum cost.

HOLZ Pivot-Flite, for medium and light duty, hinge on stainless steel pins—attach to belt with patented rubber fasteners to relieve stress when passing over small diameter pulleys; increase belt life!

HOLZ also offers **Vulca-Flite** cleats, permanently vulcanized to belt covers to your specification. Side flanges and special belt attachments available.

Whatever your product, there's a precision-made HOLZ rubber cleat to handle it with firm, yet gentle care. Get the full story: write for details today!



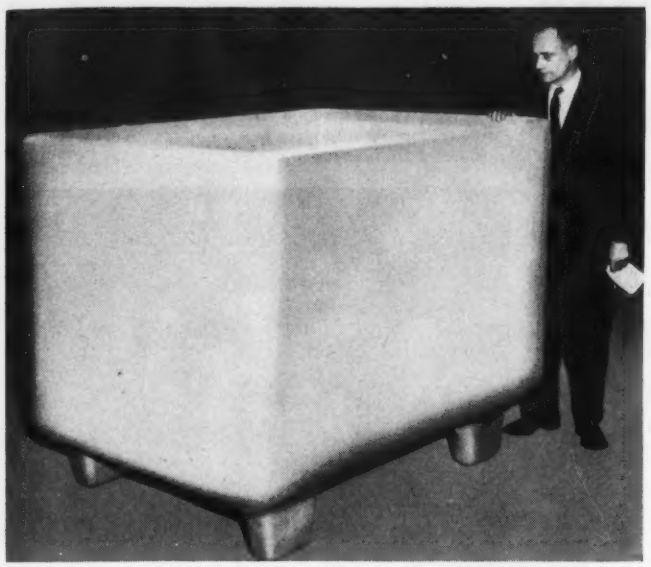
"If it's rubber we can make it!" . . . serving industry for a quarter-century

HOLZ RUBBER COMPANY, INC.

1133 SOUTH SACRAMENTO STREET, LODI, CALIFORNIA

Dealer inquiries solicited.

7799 on Reader Service Slip.



"Hitch-Hiker" shipping container shown above weighs 323 lb (empty), measures 61 by 41 by 38 in. inside and 67¼ by 47¼ by 42½ in. outside. Foam thickness is 3 in. on sides, 4 in. on bottom; Fiberglas thickness is ¼ in. Moisture permeability is extremely low, "K" factor is .12, cost — from $360

Movable deep freezer made of rigidified film . . .

Permits economical shipment of frozen foods via unrefrigerated trucks

NORB LEINEN
Associate Editor

Lightweight, ultra-strong cold-storage bins with high insulating efficiency—now being introduced commercially by Space Structures, Inc., Chanhassen, Minn.,—may have an economic impact on both the frozen foods and the trucking industries.

(Similar bins, now in use by the food industry for in-plant handling, were described in January 1960 FP, "Lightweight Bins Hold Heavy Loads").

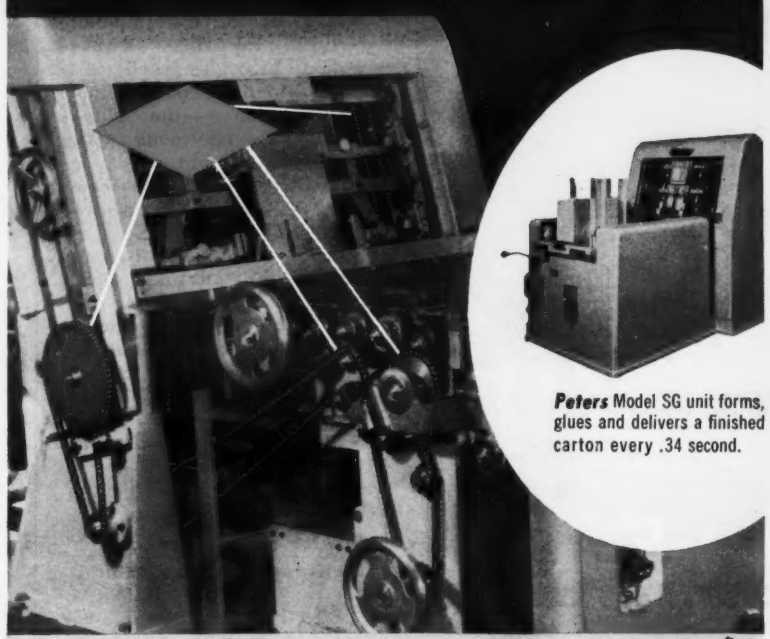
New bin development—a four-legged box made of a polyurethane foam-and-Fiberglas sandwich, and called "Hitch-Hiker" — has tested out impressively from the standpoints of cutting costs and product losses for handlers of frozen items.

The bins are especially suited to shipment of cold products to outlying customers in LCL and LTL quantities. A loaded container can be dropped and an empty picked up—saving long stopovers and backtracking, and resulting in more efficient route coverage.

Also, because the "Hitch-Hiker" weighs approximately one third less than currently-in-use insulated steel boxes of comparable capacity, savings are effected even when empty units are dead-headed back to the shipper.

Insulating efficiency of the

Peters Packaging Machine
synchronized by
DIAMOND Roller Chain
delivers 175 cartons a minute



Peters Model SG unit forms, glues and delivers a finished carton every .34 second.

A small error in split-second timing could cause a monumental snarl of cartons, glue and machine parts. To insure *precise synchronization* and dependable, trouble-free performance, Peters Machinery Company, Chicago, Illinois, specifies DIAMOND Roller Chain for high-speed packaging equipment.

The proven strength, durability and high dimensional accuracy of DIAMOND Roller Chain offer many opportunities to improve and simplify machine design . . . to solve conveying, timing and power transmission problems.

Write for catalog containing complete information on DIAMOND Roller Chain and Sprockets. Engineering assistance is available.

DIAMOND CHAIN COMPANY, INC.
A Subsidiary of American Steel Foundries
Dept. 410 • 402 Kentucky Ave., Indianapolis 7, Indiana
Offices and Distributors in all Principal Cities

DIAMOND ROLLER CHAINS ®

7800 on Reader Service Slip.

WALKER

STORAGE
and
TRANSPORT
EQUIPMENT

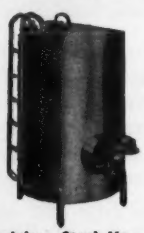
Wherever storage and transport of food products is required, Walker can supply the unit that will give you dependable economical performance.

We will gladly supply you with complete data and prices on the equipment you need.

STORAGE TANKS, Round, Oval and Rectangular. All sizes Standard or Cold Wall surface.

TRANSPORT TANKS. Trailerized and truck mounted. One, two or three compartments.

FIBRE-GLASS COOLER DOORS. All types and sizes of insulated doors.



Stainless Steel Vertical Holding and Surge Tanks

Write today for literature on our complete line of stainless steel and fibre-glass equipment for the food industry.

WALKER

WALKER STAINLESS EQUIPMENT CO.
Dept. 45, New Lisbon, Wisconsin

7801 on Reader Service Slip.

new container is evident from field tests. One of these, involving shipment of dry ice by an Omaha distributor, lasted several weeks and covered hundreds of miles.

With the container getting normal handling at all stops on the route, results nevertheless indicated that its use would cut dry ice loss during shipping by more than 25 per cent.

Made of three completely bonded layers — double-walled Fiberglas shell with foamed-in-place polyurethane as insulation — the "Hitch-Hiker" has enormous structural strength, but can be repaired in minutes with something as simple as an inexpensive boat-repair kit.

Units can be varied in many ways to suit customer needs. Legs can vary in height from 4½ to 9½ in., color can be used (it permeates the full Fiberglas layers), capacity can range from 64 cu ft to trailer size.

7802 on Reader Service Slip.

Stretch single-manhole transport tank length limit

Effective on July 5, 1960, automotive milk transportation tanks with single manholes may be seven ft longer than previously, and still comply with 3-A Sanitary Standards.

This is effect of amendment to the 3-A Sanitary Standards for Stainless Steel Automotive Milk Transportation Tanks for Bulk Delivery and/or Farm Pick-up Service, approved March 2 at the regular semi-annual meeting of the 3-A Committees in Athens, Ga.

Under previous 3-A Standards, either end of a transportation tank shall not be more than 15 ft from a manhole opening; under the amended version, the ends shall not be more than 18½ ft from the manhole.

The amendment, considered thoroughly justified because of improved cleaning methods in the industry and by state highway legislation which pro-

tough greasy, hot conditions slow down your production? Not with PUR-O-TEX conveyor belts!

Food processors find Ton-Tex Pur-O-Tex conveyor belting proves best for conveying foods under conditions that present some real problems. Pur-O-Tex is a white, non-toxic belting built specially to convey foods of all kinds. It is made of plies of selected duck welded with special compounds and treated to resist heat, oil, grease, water and mild abrasion. Pur-O-Tex belting won't impart taste or odor to the products carried. It is permanently pliable and can be vulcanized endless. Easy to wash and keep clean — an excellent "inspection" belt. Let our engineers help you select a trouble-free belt for your conveying jobs. *Write for folder today.*

TON-TEX CORPORATION, GRAND RAPIDS 2, MICH.
31 COLUMBUS AVENUE, ENGLEWOOD, NEW JERSEY
1180 AUZERAIS AVENUE, SAN JOSE 26, CALIFORNIA

TON-TEX CONVEYOR AND TRANSMISSION BELTING

7803 on Reader Service Slip.

DURABILITY★EFFICIENCY★VERSATILITY
ARE COMBINED TO MAKE THE
MEYER *Continuous* BUCKET ELEVATOR
ADAPTABLE TO ANY CONDITION OR CAPACITY REQUIREMENT...

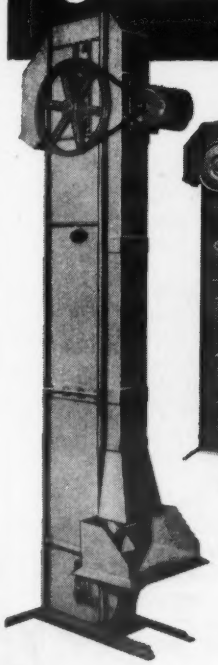


Fig. A

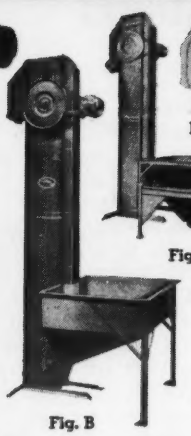


Fig. B

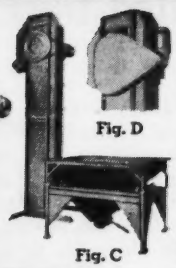


Fig. C

Fig. D

MEYER BUCKET ELEVATORS are furnished in low speed models, in any height or capacity, for gently handling bulk material without breaking or jamming. Intake design prevents material from falling into elevator boot, and positive discharge prevents inter-mixing when various products are alternately run in the same elevator. Built of heavy gauge steel with sealed, self-aligning bearings throughout for continuous heavy duty operation. They are available with Cast aluminum alloy, or fabricated stainless or mild steel buckets mounted on heavy duty roller chains.

AVAILABLE WITH HOLDING OR FEEDER-HOPPERS IN SIZE OR TYPE DESIRED

Fig. A. Standard Small Production Type Hopper. Fig. B. Large Holding Hopper. Fig. C. with Portable VIBRA-FLEX Feeder-Hopper. Also available with Gear Motor Drive as in Fig. D.

MEYER
MACHINE COMPANY
3528 Fredericksburg Road
SAN ANTONIO 1, TEXAS
MANUFACTURERS OF
CONVEYING
ELEVATING
AND
PROCESSING
EQUIPMENT

Write for Bulletin 912

7804 on Reader Service Slip.

vides for longer trailers, will permit larger over-the-road tank capacities for single-manhole tanks.

3-A Sanitary Standards are recommended by committees representing sanitarians and public health officers, equipment makers and dairy processors. In general, equipment bearing the 3-A Symbol is acceptable in nearly all health jurisdictions in the US and Canada.

Diverts pneumatic stream by electrical impulse

Described as the simplest, lightest and most economical means of diverting a pneumatic stream from one point to another by electrical impulse, Semco Diverter Valve

Diverter valve has only recently been placed on market

is plant air-operated and controlled by a two-wire, four-way solenoid valve.

Action of the valve is instantaneous, the seal is perfect and there are no sliding parts requiring troublesome maintenance.

Supplier: Systems Engineering and Manufacturing Co., Inc., P.O. Box 7634, Houston 7, Texas.

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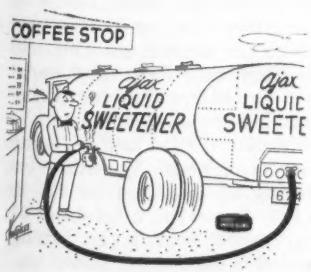
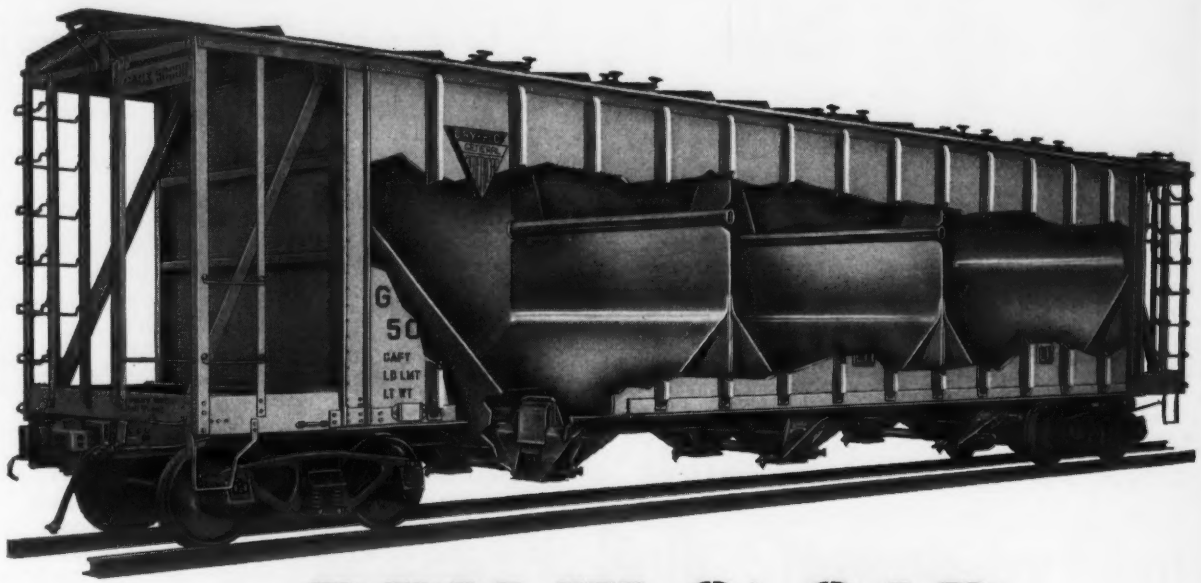


Ship Chemicals, Food Stuffs, Feed Ingredients in bulk in the New



DRY-FLO® CAR

General American's new Dry-Flo car brings the economies of bulk shipment to many dry, granular or powdered products which otherwise require bags, drums or containers.

Competitive in price with ordinary covered-hopper cars, the Dry-Flo car keeps the lading contamination-free and seals it from the outside air.

The Dry-Flo car can be loaded easily and quickly by either pneumatic or mechanical systems. Rounded hopper corners and clean interior lines eliminate hang-up points, insure complete discharge of product. Interiors can be coated.

All this adds up to important savings for shippers.

Consult us about *your* shipping problems. If you make, buy or sell dry, granular products, chances are you will profit from shipping by Dry-Flo car.

**Patent Rights Reserved*

IT PAYS TO PLAN WITH GENERAL AMERICAN

Airslide® and Dry-Flo® Car Division
GENERAL AMERICAN TRANSPORTATION CORPORATION
135 South La Salle Street • Chicago 3, Illinois
Offices in principal cities
In Canada: Canadian General Transit Co., Ltd., Montreal

DRY-FLO GENERAL AMERICAN TRADE MARK

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"Delrin" Conveyor Chain

Nylite Conveyor Chain is now Nylite "D" Conveyor Chain made with Dupont's new "Delrin" acetal resin

. . . a completely new material that offers you metal-like mechanical properties, such as a high degree of strength and rigidity . . . plus properties that metals do not possess.

Under rigid comparative tests for the past two years, Nylite "D" Conveyor Chains experienced:

- no Lubrication
- 1/10 the water absorption, 1/6 the stretch of previous non-metallic type . . . and 20% heavier.
- no warpage, no buckling . . . holds better to conveyor
- no loss of rivets (switched from pins to rivets)
- longer life and lower costs than stainless chain
- higher speed than metal chain.

Now in stock: 3" — 3¼" — 4" — 4½" — 6" — 7½" widths

Write today for new pamphlet

FENCO, INC. | 125 N. Racine Ave. Chicago 7, Illinois

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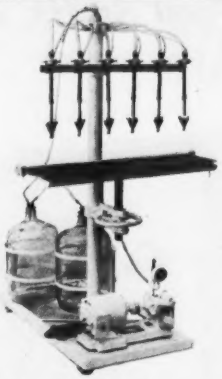
BOTTLE FILLING PROBLEMS?



Model BV-1 Vacuum Filler with 6 stainless steel spouts, crated f.o.b. Los Angeles—$655.00

Solve your bottle filling problems with the OGDEN BOTTLE FILLER!

This dependable, accurate, and rapid filling machine is the most versatile bottle filler on the market today for small production and semi-automatic operations. The OGDEN filler will handle practically any type and size of container — glass, plastic, or metal — from 4 ounces to 1 gallon, and most liquids including foaming products. Fill rate for 6-spout machine on light liquids — 600 quarts per hour. The OGDEN Bottle Filler is also noted for its low initial cost and inexpensive operation and maintenance.

For more than 27 years, OGDEN Bottling Equipment has been used for efficient production packaging of . . .

- Juices • Sauces • Non-carbonated beverages
- Syrups • Oils • Many other liquid products

WRITE TODAY — for general catalog and low prices!

OGDEN *filter Co., Inc.*
4214 SANTA MONICA BLVD., LOS ANGELES 29, CALIF.
"Manufacturers of fine filtration equipment since 1929"

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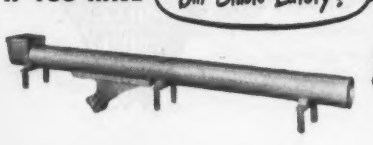
"BUT CAN A VIBRATING CONVEYOR MOVE MY STUBBORN MATERIALS, TOO?"

SURE, CLEVELAND VIBRATOR CONVEYORS MOVE MOST ANY GRANULAR MATERIALS!
TAKE FLUFFY POWDERS FOR EXAMPLE. TIERS PROVIDE MORE VIBRATORY SURFACE-SO THEY DON'T COMPACT!
AND CHUNKY MATERIALS ARE A CINCH!
CLOSED CONVEYORS PREVENT CONTAMINATION OR SPILLAGE!
-AND GENTLE VIBRATORY ACTION WON'T BREAK OR CHIP BRITTLE PARTICLES!
ACCURATE CONTROL-STARTS, STOPS AND REGULATES FLOW SAFELY AND SURELY. SO...
HOT OR COLD, DRY OR WET, CLEVELAND CONVEYORS MOVE BULK MATERIALS-EVEN SORT 'EM!
THERE IS A CLEVELAND CONVEYOR THAT WILL MOVE MY PROBLEM MATERIALS!
MOVE YOUR MATERIALS, TOO!
CLEVELAND

IF YOU HAVE *Bin Stuck Lately?*



CALL CHerry 1-7157 FOR A FEEDER OR CONVEYOR *for every installation ...every need*

THE CLEVELAND VIBRATOR CO.
7G-2818 Clinton Ave., Cleveland 13, Ohio

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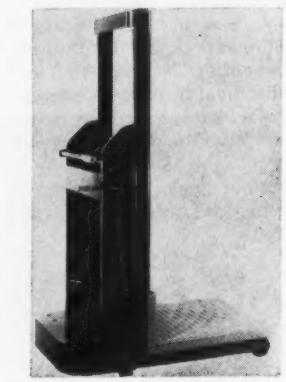
New developments in fork lift trucks



Newly redesigned for more efficient operation, reduced maintenance and improved appearance, line of "Safeway" manual-lift and battery-powered portable elevating trucks features such improvements as:

close-tolerance assembly of carriage rollers and alloy-steel mast channels so that they ride together easily, eliminating need for grease or lubricants of any kind;

lifetime-lubricated sealed roller bearings on the steel fork-carriage rollers;

rounded top corners on the "forks" that carry the outrigger wheels, allowing easy and damage-free sliding under skids or pallets;

improved rigidity of the lifting-chains' cross-head, eliminating any rocking action due to off-center loading.

Supplier: The American Pulley Co., 4214 Wissahickow Ave., Philadelphia 29, Pa.

7810 on Reader Service Slip.

Low-cost, all-purpose lifter, priced at only $194, serves as a utility lift and transport truck for tiering, stacking and loading and frees high-rated power equipment for bulk-handling operations.

Model FPD Little Dickie needs minimum foot effort for lifting of loads up to 750 lb (1000 lb test) to a height of 64 in. above floor level. Lifting speed is one in. per stroke under full load.

Hydraulically operated unit

is safe in operation, with fluid pressure holding the load, rather than an operator as in a mechanical system.

Weighing only 204 lb, unit may easily be lifted onto a truck for transport to and from application areas.

Optional equipment includes a floor lock, floor protective wheels and pipe runners to assist loading onto trucks.

Supplier: Langley Manufacturing Co., Inc., 913 Cambridge St., Cambridge 41, Mass.

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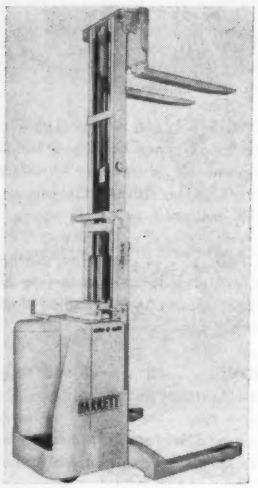

Narrow-aisle high-lift rider straddle truck stacks loads from 1000 to 4000 lb. Single right-hand lever controls both four-speed forward and four-speed reverse travel, as well as fork lifting or lowering. Steering is controlled by the left hand.

New single-package-unit gear drive has wheel, transmission, drive motor and brake mounted vertically in line with steering lever. Entire drive mechanism may be removed from truck chassis by unscrewing four bolts.

Deadman-type brake on Model RST is held in release position by driver's foot, is applied when the driver raises his foot.

Supplier: Barrett-Cravens Co., 628 Dundee Rd., Northbrook, Ill.

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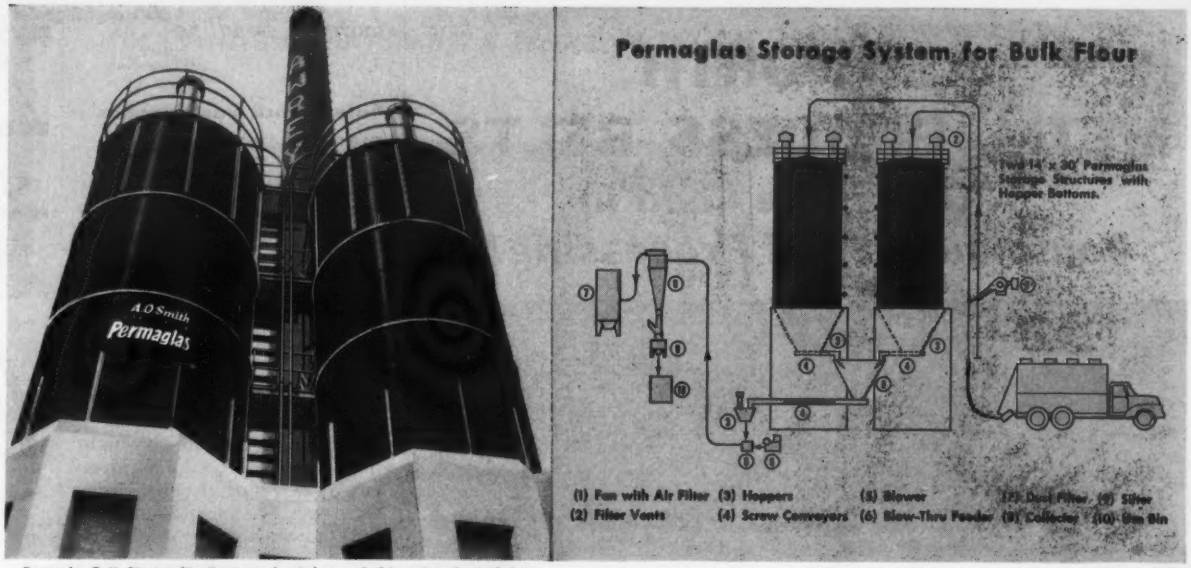
A.O.Smith
Permaglas
Permaglas Storage System for Bulk Flour
Two 14' x 30' Permaglas Storage Structures with Hopper Bottoms.
(1) Fan with Air Filter (3) Hoppers (5) Blower
(2) Filter Vents (4) Screw Conveyors (6) Blow-Thru Feeder

Permaglas Bulk Storage Structures are located on roof of two-story Awrey bakery.

***Awrey Bakeries, Inc. reports these cost-saving benefits from its* Permaglas® Bulk Storage System**

- ***Savings of $1,200 per month for 12,000 flour bags. Savings of 4.5c per cwt. from intercity truck delivery.***
- ***Savings of 400 manhours per month on inplant handling time...freeing 2.5 men for other baking duties.***
- ***Savings on 1,200 sq. ft. of inplant space, providing storage area for economical purchases of other ingredients.***

DETROIT, MICHIGAN — Awrey Bakeries, Inc., paid for its two 14′ x 30′ *Permaglas* Bulk Storage Structures and a combined automatic receiving and inplant pneumatic conveying system *within a period of 20 months.* This was made possible from substantial savings realized by converting to automatic handling and storage of bulk flour in two *Permaglas* Structures (glass-lined inside and out) which provided cost-saving benefits: in handling labor . . . reduction in intercity delivery costs . . . elimination of flour bag purchases . . . less maintenance and housekeeping . . . no flour losses due to infestation.

Awrey's receiving system, designed to handle 30,000 lbs. per hour of bulk flour, and its inplant pneumatic conveying system with a capacity of 20,000 lbs. per hour are considered to be unique in the baking industry. The outstanding feature of the inplant system is the hollow-flight, steam-jacketed screw conveyor which is designed to heat 20,000 lbs. per hour of wheat flour to a selected temperature.

The *Permaglas* Bulk Storage Units in this system are glass-fused-to-steel construction, providing utmost sanitation, and ease of cleaning . . . safeguards flour from contamination, and reduces periodic structure maintenance to a minimum.

Be sure to include an A. O. Smith *Permaglas* Bulk Storage System in your modernization and expansion plans. It's a low-cost, life-time investment that pays for itself within a relatively short period of time. For more details, mail coupon today.

Through research ...*a better way*

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CORPORATION
HARVESTORE PRODUCTS DIVISION
KANKAKEE, ILLINOIS
A. O. Smith International S.A., Milwaukee 1, Wis.

A. O. SMITH CORPORATION
Permaglas Storage Units, Dept. FP-70
Kankakee, Illinois
Send me free Permaglas Mechanized Storage Unit Bulletin MU-107.

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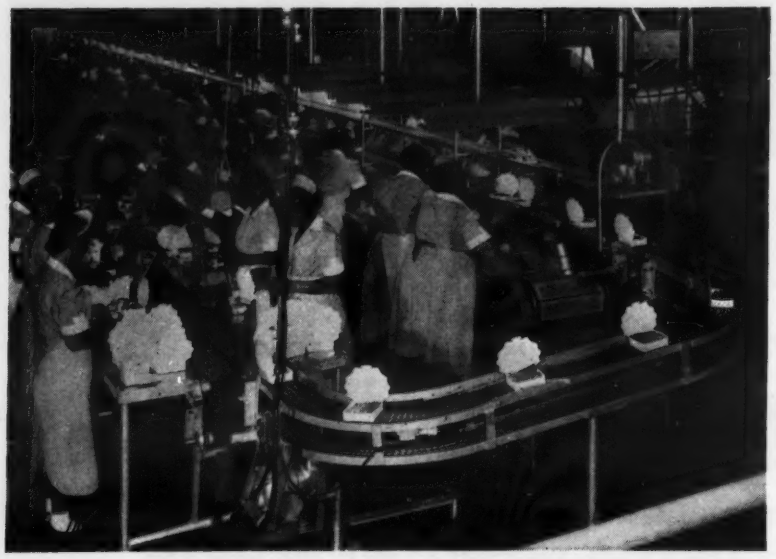
ASHWORTH METAL PROCESS BELTS

... Carry The Load in Continuous Food Processing!



This patented ASHWORTH Omniflex Belt carries frozen asparagus around corners *and* on the straight-away . . . with NO transfers . . . *What's Your Product?*

Whether it is baking, deep frying, quick-freezing, cooling or any other process operation, you can keep your product on the move better with a belt designed to do the specific job . . . for instance, when the product is carried directly on the belt, either type 304 or type 316 stainless steel can be furnished.

Where analysis of service requirements indicate special design for particular application, Ashworth Field Representatives are trained and qualified to develop the information necessary to enable Ashworth Engineers to "job engineer" the correct belt for that job. Longer life, lower maintenance and proper performance under the most exacting conditions are the qualities you can depend on . . . when you specify Metal Process Belts by ASHWORTH BROS., INC.

Illustrated literature available, write:

ASHWORTH BROS., Inc., Winchester, Virginia

Sales Engineers: Atlanta, Berkeley, Calif., Birmingham, Ala., Charlotte, N. C., Chicago, Cincinnati, Cleveland, Dallas, Danvers, Mass., Detroit, Greenville, S. C., Houston, Long Beach, Calif., New York, Philadelphia, Pittsburgh, Rochester, St. Louis, St. Paul, Tampa, Tonawanda, N. Y., Canada: Montreal, Toronto, Mexico

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material handling

Rates 'truck performance' precisely in seconds

New slide rule that mathematically measures truck performance in a few seconds eliminates extensive paperwork in determining the following information:

1) what hp is needed to obtain a desired performance, including air resistance and road surface considerations, for a specific gross weight;

2) how much gross weight may be carried with a given engine and still attain this desired performance;

3) how steep a grade and at what speed a specific vehicle can climb;

4) what road speed is best for a specific engine and known gross weight;

5) how fast the vehicle may go, based on tire size, engine speed and total gear ratio;

6) what axle ratio is required to attain this maximum speed;

7) what is the engine speed (rpm) for a known road speed, with various tire sizes and total gear ratio.

Because all of the above knowledge is relative, certain facts — net engine hp, gross wt, per cent grade, speed in gear ratio, engine rpm and tire rpm — must be known to determine an unknown.

Slide rule contains complete operating directions, plus tables on tire rpm, air resistance hp and altitude and road surface correction factors

Rule's upper slide, which calculates answers for points 1) through 4) in listing above, is based on 87 per cent chassis efficiency.

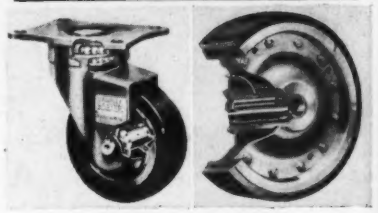
The precision instrument, built by Perrygraf Corp. of Los Angeles to specifications of The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio, is available at approximately cost — $3.75 apiece — from White Motor Company.

For YEARS of SERVICE

WITH TROUBLE-FREE PERFORMANCE

DARNELL

CASTERS AND WHEELS



RUBBER TREADS . . . a wide choice of treads suited to all types of floors, including Darnelloprene oil, water and chemical-resistant treads, make Darnell Casters and Wheels highly adapted to rough usage.

RUST-PROOFED . . . by zinc plating, Darnell Casters give longer, care-free life wherever water, steam and corroding chemicals are freely used.

LUBRICATION . . . all swivel and wheel bearings are factory packed with a high quality grease that "stands up" under attack by heat and water. Zerk fittings are provided for quick grease-gun lubrication.

STRING GUARDS . . . Even though string and ravelings may wind around the hub, these string guards insure easy rolling at all times.

DO YOU HAVE YOUR COPY?

IT'S FREE! SEND FOR IT TODAY!

Look in the Yellow Pages for your Darnell Distributor under "Casters"

DARNELL CORPORATION, LTD.

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Most Complete Line Ever!

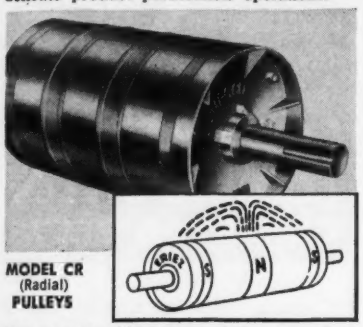
ERIEZ

permanent non-electric Erium-powered

MAGNETIC PULLEYS

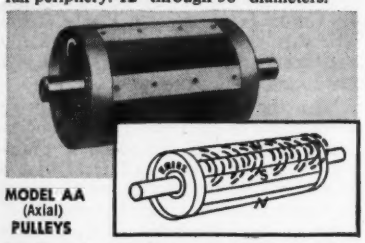
Now in 2 "duty-rated" designs—to give you the finest automatic separation for your exact application—fine iron or tramp iron removal.

NEW, EXPANDED LINE! New design, new magnetic efficiency permit increased operating range and effectiveness with 2 different magnetic actions. Peak protection for all operations —from rugged crusher protection through delicate product purification operations.



MODEL CR (Radial) PULLEYS

For removing large pieces of tramp iron from heavy depths of flow. Provides a strong, deep magnetic field of equal intensity around the full periphery. 12" through 36" diameters.



MODEL AA (Axial) PULLEYS

Excellent for nne iron separation, as well as small and medium pieces of tramp iron, in average material flows! Strong magnetic field of equal force extends across the full width of the pulley. 8", 12", 15", & 18" diameters.

Prevent product contamination, machinery damage, fires, explosions, downtime. 2 designs, 4 magnetic strengths, 8 diameters, 14 belt widths. No operating or maintenance costs. For all materials, wet or dry, on belts of non magnetic material. Fast, simple installation.

*Erium —an exclusive, high quality permanent magnetic power source specifically designed and energized by Eriez.

New fact-filled 6-page bulletin has installation photos, selector guide, etc. Write today! Eriez Mfg. Co., 75-GA Magnet Drive, Erie, Pa.

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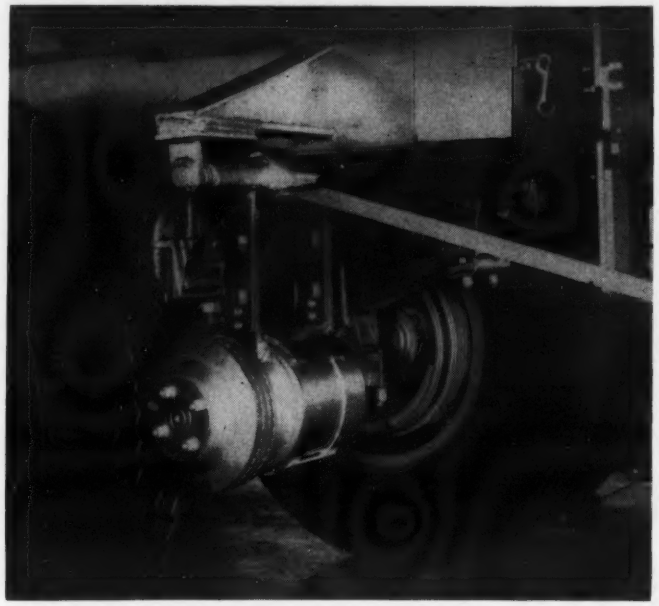

Wheel-driven alternator causes no measurable tire wear, tests show. Unit draws approximately one hp from wheel when lowered by lever into contact position

System long-proved with 'reefer' cars . . .

Use wheel rotation to power cargo cooler

- **Eliminates fuel, overhaul and maintenance costs of extra engine**
- **Keeps ice-cooled trailerload at uniform temperature**

Completely shielded and waterproof air-circulating fan is located at top of forward ice bunker, with venting through the bulkhead

A cargo-cooling system that is used on 70,000 railroad refrigerator cars now has been adapted for use in ice-bunker trailers for fresh produce hauling.

Called the "Cargotemp" system by manufacturer — Preco Corp., 6300 E. Slauson Ave., Los Angeles 22, Calif., components include a forced air fan mounted at top of bulkhead in trailer van and a totally enclosed alternator mounted against one wheel of trailer, which drives the fan.

(Standby service is provided by plugging fan into any 110-v AC outlet.)

System is being used by at

UNSTICK stuck BINS

with new electro-permanent magnetic

ERIEZ

HI-VI BIN VIBRATORS

Here's the newest and most efficient answer to those hard-to-move materials in sticky bins . . . designed to provide superior operating efficiency . . . exclusive pinpointed vibration gets right to the trouble spot – starts stubborn materials moving!

NO RECTIFIER NEEDED • COMPLETELY ENCLOSED HOUSING • GREATER VIBRATION IMPACT THAN COMPARABLE SIZE UNITS • RUGGED AND DURABLE • LOW FIRST COST • LOW OPERATING AND MAINTENANCE COST

Special Mill Mutual ACCEPTED Units for HAZARDOUS DUSTY LOCATIONS

GET BIG CATALOG . . . WRITE TODAY
Eriez Mfg. Co., 75-GB Magnet Dr., Erie, Pa.

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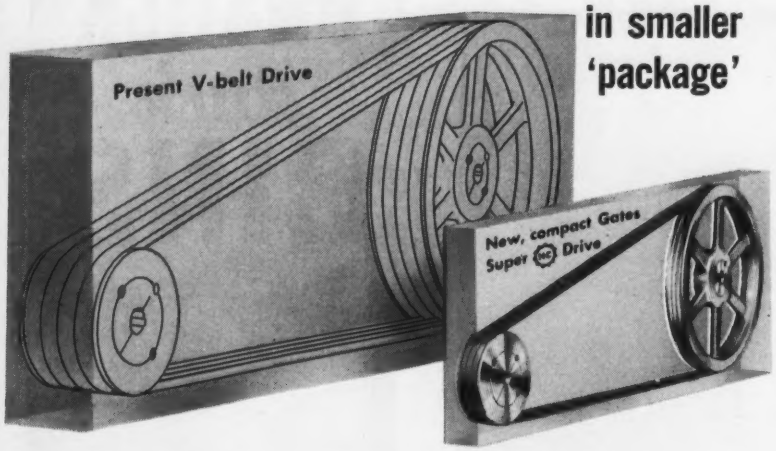
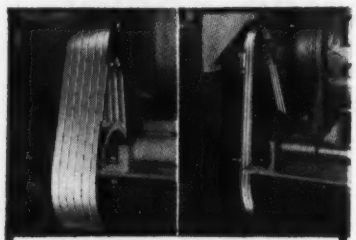


Same HP capacity in smaller 'package'

Industry cuts drive costs as much as 20% with Gates high capacity V-Belts

By putting power transmission in a smaller package, Gates 'performance-proved' Super HC V-Belt Drive has cut costs all along the line—for all kinds of industries—since its introduction more than a year ago.

As a replacement drive on equipment *inside* the plant, or as the drive on equipment *manufactured for sale* the Super HC Drive has enabled thousands of industrial users and OEM's to reduce sheave diameters 30% to 50%, overall drive space up to 50%, and drive weight 20% and more. *Initial drive cost has been cut as much as 20%.*



BEFORE ◄ AFTER ►

COMPARE: Conventional drive at left was replaced with Gates new Super HC V-Belt Drive at right. Three of Gates new, narrow HC V-Belts do the work of the former 6 standard width belts. In this application the new drive actually takes *one-third* the space of old!

Nation-Wide Engineering Service

A Gates Distributor can show you how to effect savings with Super HC V-Belt Drives. Ask him for your free copy of *"The Modern Way to Design Multiple V-Belt Drives,"* or write to The Gates Rubber Company Sales Division, Inc., Denver, Colorado.

TPA 535

The Gates Rubber Company, Denver, Colorado
Gates Rubber of Canada Ltd., Brantford, Ontario

Gates *World's Largest Maker of V-Belts*

Gates Super HC V-Belt Drives

7818 on Reader Service Slip.

least two contract carriers for major food chains, and by 20 other independent California and Canadian truckers.

Wheel-driven system replaces gasoline engines and eliminates daily operating expenses such as oil, gas, lubrication, servicing, overhauls and similar maintenance.

Truck system has had three years' field experience. Tests by USDA Fruit and Vegetable Division, Fresno, Calif., on air-cooled truck shipments of perishables have been highly favorable.

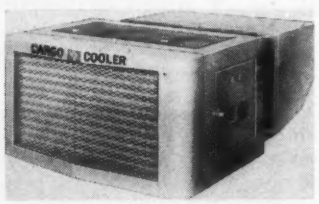
These tests indicate that a 10 to 15 F difference normally exists from top to bottom of refrigerated, non-air-cooled vans. With forced air, differential is only 1 to 2 F.

7819 on Reader Service Slip.

Lightweight, heavy-duty truck-powered cargo cooler

Uses: Compact unit can be used in adequately insulated bodies up to 18-ft long, efficiently maintaining in-transit temperatures for packing house products, milk and dairy products and other commodities requiring 30 F or above.

Features-Description: Powered directly by the truck engine, the Model C-10-B consists of a self-contained "factory package" that contains



Weighing only 376 lb, cooling unit comprises a self-contained "factory package"

all components, except the compressor — is designed for mounting through a prepared opening in upper front wall of the truck body.

The high-speed automotive-type compressor mounts on and is driven by the truck engine, by means of a V-belt from the crankshaft. Flexible refrigerant hoses and connec-

BY simply removing a cross wire or two with a pair of pliers, you can take out, add to or replace one or more sections of La Porte Belts. It takes only a few minutes and the belt need not be taken from the La Porte Drive Sprocket. The cross wires are readily replaced and downtime is held to a minimum.

But there are other money-saving advantages of La Porte Flexible, open-mesh construction. It speeds up drainage, it facilitates sterilizing with a steam gun. It permits the circulation of air and liquids around products in process. And prevents products from rolling off. La Porte Belts are built for long service and are easily installed.

If you freeze, can, dehydrate, pickle, package, store or ship food, it will pay you to use La Porte belts. Available in ½" x 1", or 1" x 1" in any length and practically any width. Ask your mill supplier or mail coupon for illustrated literature and prices.

MAIL COUPON TODAY

LA PORTE MAT & MFG. CO.
Box 124 Dept. A
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Please send free literature on your Conveyor Belt.

NAME_____
ADDRESS_____
CITY_____ STATE_____

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tions are supplied.

Evaporator and condenser fans are powered by a 12-v, ¼-hp DC motor with heavy-duty ball bearings and replaceable brushes. Electric motor receives its power from the truck's generator, drives both the evaporator and condenser fans continuously at a constant speed.

Unit's dimensions are: outside truck body — 18½ in. high, 36 in. wide and 24½ in. deep; inside body — 17 in. high, 32 in. wide and 21 in. deep.

Mounting brackets and drive belts, for mounting compressor on truck engine as power source, are available for all popular truck makes and are included in purchase price.

A manual "on-off" switch permits the C-10-B to be turned off when refrigeration is not required. The unit also is available (as Model CE-10-B) with AC electric standby power for dockside or overnight operation.

Supplier: Hunter Manufacturing Co., 30525 Aurora Rd., Cleveland 39, Ohio.

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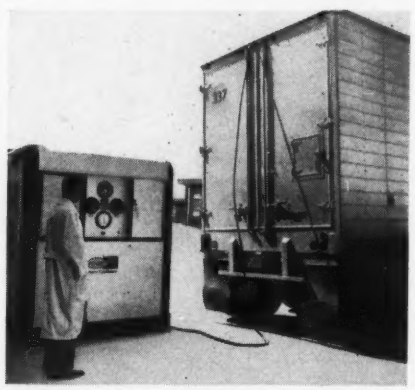
"Afraid we'll have to call in the experts — I never was any good at repacking valves."

40° above to 60° below in 2½ minutes*

...WITH PURECO CO_2 "BLAST CHILLING"



The AFDOUS uniform code being adopted by both states and food chains requiring the maintenance of near zero temperatures for the handling and shipping of frozen foods, creates the need for additional refrigeration techniques.

Pureco Blast Chilling gives quick "pull-down".

Pureco carbon dioxide liquid sprayed into the truck or car reduces interior temperatures to sub-zero in seconds. The warm, moisture-laden air is flushed out and replaced with cold, dry vapor, preventing any "heat shock" from loading temperatures. Time consuming pre-cooling periods are shortened, and after loading pull-down periods of two to four hours are eliminated, resulting in savings in fuel and maintenance.

No special equipment is needed.

Pureco CO_2 *Blast Chilling* needs no special equipment . . . it works with what you now have . . . mechanical units, hold-over systems or "DRY-ICE".

Have a trial Blast Chilling demonstration.

Pureco would like to demonstrate *Blast Chilling* to you in *your plant* under *your working conditions* . . . with no obligation on your part . . . Pureco's Technical Sales Service will make the demonstration and provide any technical assistance you need to help solve your refrigeration problems efficiently and economically with Pureco CO_2. Call your local Pureco man for details or write to:

**Actual Pureco Test*

PURECO CO_2

PURE CARBONIC

Pure Carbonic Company, A Division of Air Reduction Company, Incorporated
Nation-Wide Pureco CO_2 Service-Distributing Stations in Principal Cities
General Offices: 150 East 42nd Street, New York 17, N.Y.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND AN AIR REDUCTION PRODUCT

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KEEP YOUR TRUCKS ON THE ROAD AND OUT OF THE SHOP!

NO INVESTMENT...NO UPKEEP

LEASE HERTZ

Now, with Hertz Truck Lease Service, you can get your trucks out of the repair shop for good—and keep them back on the road full time. Forget about repair problems. When you lease from Hertz, trucks are kept in top operating shape with a proven preventative maintenance program. And, with Hertz Truck Lease Service, your capital is released for vital business improvements.

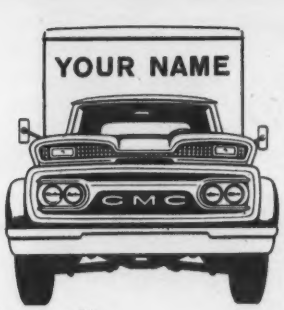
Hertz will give you cash for your present trucks. You get new GMC, Chevrolet or other sturdy trucks of your choice—all bearing your company identification—all custom-engineered to your specifications. Or your present trucks can be reconditioned and leased back to you. Either way, you're out of the truck and repair business. And you're back in your business *full-time* with new found capital that's ready to work.

Just one budgetable check per week includes these Hertz services: complete truck maintenance, garaging, washing, licensing, insurance and emergency road service. Hertz will also provide replacement trucks when needed—and extra trucks for peak periods.

Hertz gives you more—much more! You benefit from the experience of the oldest, most respected name in truck leasing. You benefit, too, from the convenience and efficiency of fully-staffed, fully-equipped Hertz local truck stations throughout the U. S. and Canada. Call your local Hertz Truck Lease office for details. Or write for this booklet—"How To Get Out of the Truck Business"—to: HERTZ TRUCK LEASE, Dept. N-7, 660 Madison Ave., New York 21, N.Y.

HERTZ TRUCK LEASE®

TRUCKS



HERTZ ALSO RENTS TRUCKS BY THE HOUR, DAY OR WEEK

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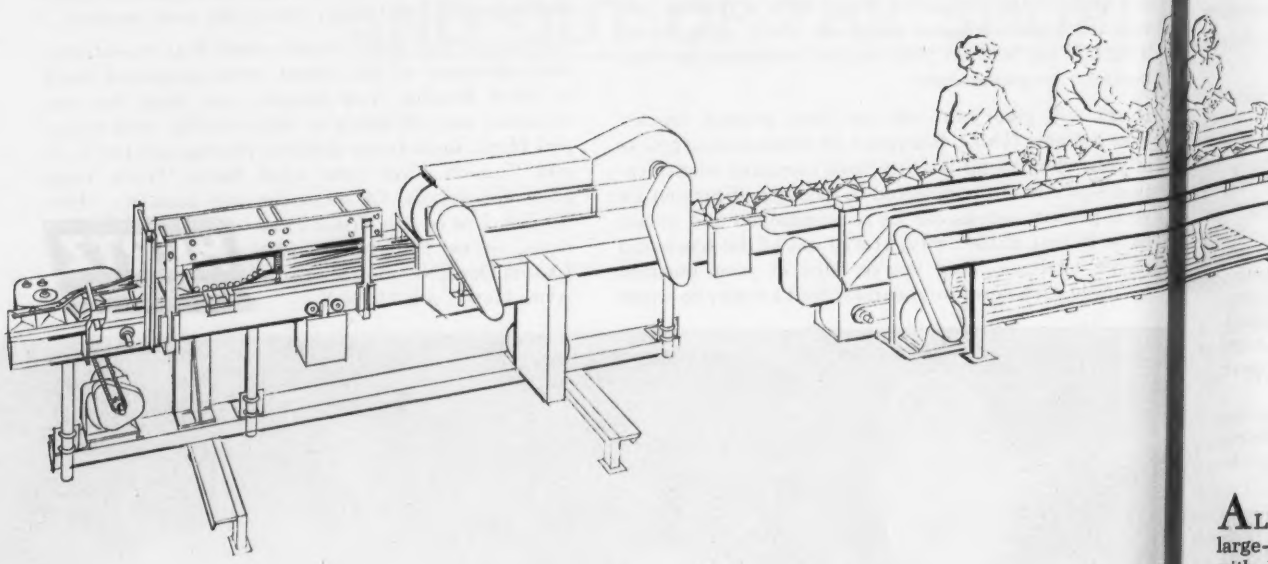
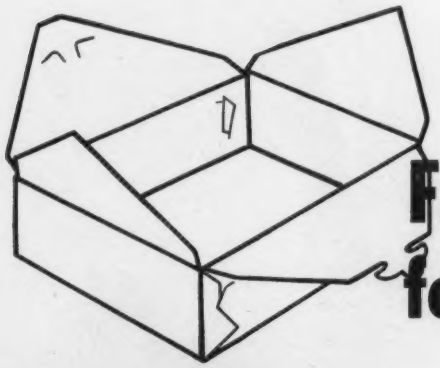


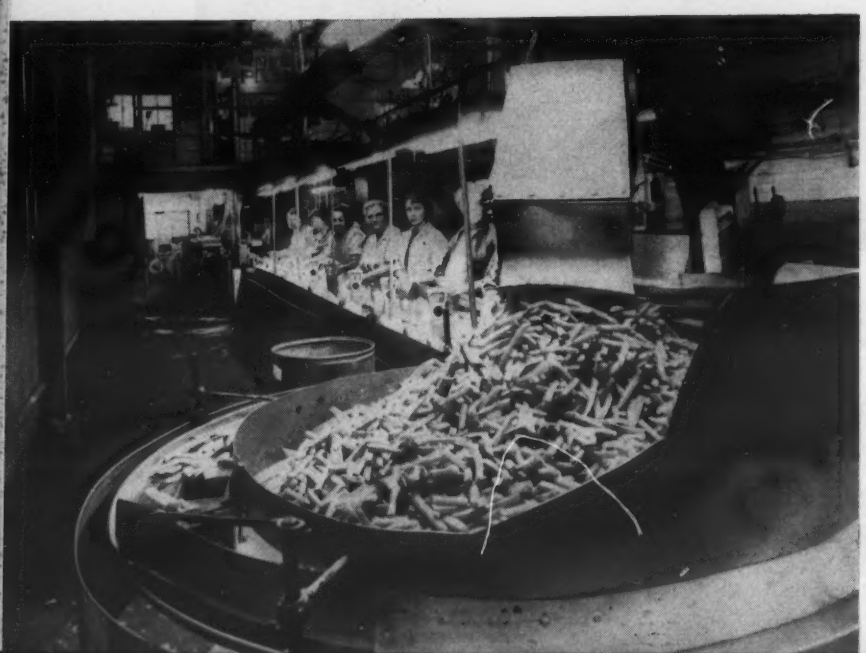
NORB LEINEN
Associate Editor



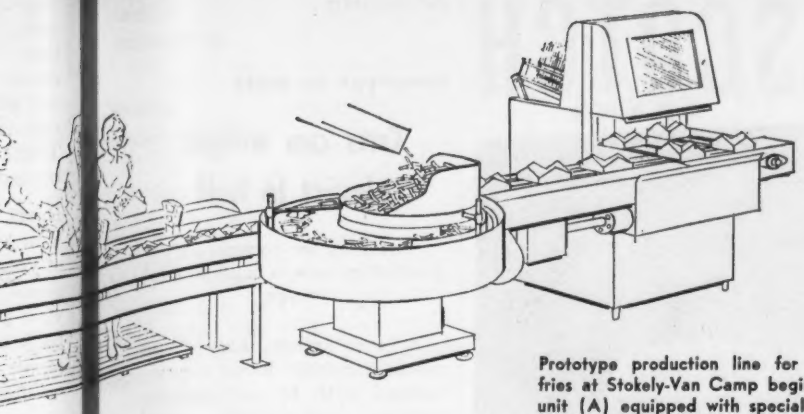
Actual major-scale production-line test with frozen French-fries at Stokely-Van Camp demonstrates that new machine-carton combination provides . . .

Fast, efficient cartoning for hard-to-pack foods

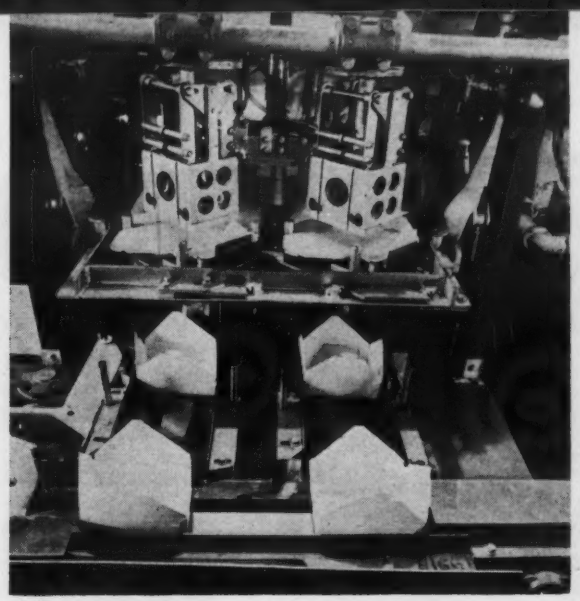
- **Less product waste during fill**
- **Minimum damage to product or carton**
- **Sturdy closure over bulky product**
- **Rewrapping overwraps cut to ½ of 1%**



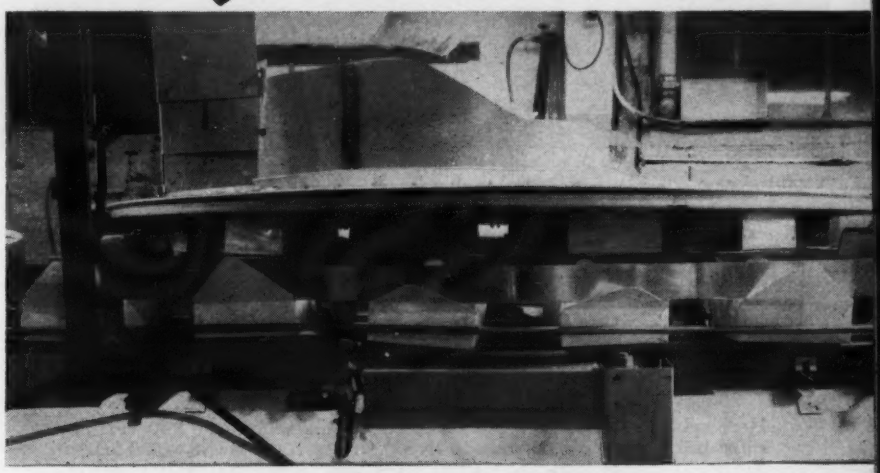
In-plant view of Stokely-Van Camp, looking downstream from filler toward checkweighers and end of the cartoning line (beyond checkweighers)



Prototype production line for frozen French-fries at Stokely-Van Camp begins with forming unit (A) equipped with special forming heads for diagonal-fold cartons. After set-up cartons pass through filler (B), they are conveyed to checkweighers (C), then are placed on a second, parallel conveyor line and carried to the closing operation (D)



Forming unit sets up four guide flaps for more effective filling; firmer, lock-free ends for better overwrapping



Close-up of filling operation shows how carton movement is controlled by contact between guide rails and carton flaps

ALREADY sucessful in a large-scale production test with French-fries, newly developed "Diafold" machine line and carton system is expected to provide equally attractive advantages with such ordinarily hard-to-pack vegetable items as broccoli, asparagus spears and other filler-packed and hand-packed vegetables.

New Diafold carton was developed by engineers at Marathon, a Division of American Can Co., Menasha, Wis., in effort to solve problems inherent in packaging frozen French-fried potatoes. Chief among these problems have been:

1) too much product loss during filling;

2) damage to product in closing of cartons;

3) inefficient closure because of product bulk;

4) rewraps when product "voids" in the carton made the ends soft.

Carton is adaptation of an earlier Marathon package called Identi-pak or envelope pak — a diagonal-fold carton on which the four flaps fold in toward center of bottom panel and lock.

Starting with this "in-fold" concept, the basic carton idea was improved by moving the locks to the longer side panels (see diagram), giving more strength to the end panels for better sealability.

Many locking methods were tested on the last two in-folding top flaps before the most efficient was adopted (note diagram).

Prototype production line then was built by Kliklok Corp., Redwood City, Calif., to meet specific Marathon requests for a frozen French-fried potato line for forming and closing the Diafold carton which would accomplish four major objectives:

1) simplify the entire line for more efficient operation;

2) increase packaging speed;

3) reduce to absolute minimum damage to carton or product;

4) make use of the natural advantages of Diafold construction filling and closing.

The line is designed to use the existing Kliklok KF or KF-5 Formers, with special new forming heads for diagonal-fold cartons.

Set-up cartons, with the four top flaps extended like a hopper, are conveyed to a Food Machinery and Chemical Corporation FMC-16S filler, where they are filled with frozen French-fries.

In the next step, filled cartons move along a conveyor where they are checkweighed and placed on a second parallel line which carries them to the closing operation.

The Diafold closing section contains some new equipment and some redesigned components (such as the Kliklok Prespak and closer).

The entire assembly, designed especially for closing French-fried potato cartons, consists of: a high-speed automatic infeed with vertical shaking action, an overhead belt compression and vibrator unit which gradually presses and shakes the product down into the voids in the cartons and a closer which plows the flaps closed and locks them.

Closed and locked Diafold cartons then move to an overwrap machine.

Full-scale production run test of the prototype equipment on French-fried potatoes at Stokely-Van Camp, Zillah, Wash., proved the soundness of the Diafold principle.

Five million Diafold cartons were filled, closed and locked at a rate of 175 cartons per min. No potato breakage was found; and, cartons were so firm and perfect that less than one-half of one per cent needed rewrapping.

Nine checkweighers made correct weights on the line. The proficiency of each was increased an average of two cartons per min, or 18 cartons per min for entire line. END

Diafold components, manufactured by Kliklok Corp., 730 Broadway, Redwood City, Calif., are available by lease arrangement through Marathon, A Division of American Can Co., Menasha, Wis.
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SCOTCH BRAND

TAPEnology... industry's newest cost-cutting tool

"Tattle-tale" tape stripes itself under heat, gives you positive proof of sterilization

Here's a fast, easy, food sterilization testing-technique you can use right now. Simply tab a short strip of "SCOTCH" BRAND Autoclave Tape No. 222 to various "judas" cans being sterilized. When steam-heat pressure in retort reaches 240° F. or more, dark-colored stripes appear on tape—indicating everything's OK. Failure of stripes to appear "tattles" that proper sterilization hasn't occurred and that cans should be placed back in retort.

On in seconds—"SCOTCH" Autoclave Tape adheres to cans throughout sterilization and cooling. Peels off easily at time of packing. Tape tabs can be written on with ink, pencil or crayon—tabbed to production records as proof that batch passed test.

With "SCOTCH" Autoclave Tape you can spot-check against improper processing in vertical or continuous retorts in minutes. Positive proof of sterilization assures dollar savings—permits cutting spoilage losses to less than 0.01%.

What do you process? The ingenuity and technical resources of your 3M Representative are at your service. Ask your "SCOTCH" BRAND Tape Distributor or write: 3M Company, 900 Bush Avenue, St. Paul 6, Minnesota.

When tape costs so little, why take less than "SCOTCH" Brand?

"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.
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MINNESOTA MINING AND MANUFACTURING COMPANY
...WHERE RESEARCH IS THE KEY TO TOMORROW

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7825 on Reader Service Slip.

packaging

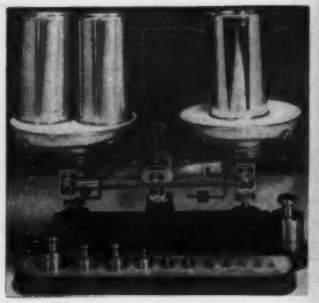
New-type tin plate . . .

Cuts can weight almost in half

Facilities for commercial production now in experimental stage

A new "lighter, thinner" tin plate, currently being experimented with by can makers, appears economically sound for can manufacture, with high potential for such uses as cans for frozen concentrates.

Produced by a new process, on which U.S. Steel is seeking patent protection, the plate



The two cans at left, made from the new thin tin plate, weigh no more than the one conventional tin plate can at right

ranges in weight from 40 to 60 lb per base box, whereas most tin plate now used by can producers is in the 75 to 100 lb base box weight range.

(A base box is a unit of measure. It contains 31,360 sq in (217.78 sq ft) of tin plate.)

The new product is believed to have the strength and rigidity needed to maintain the high-speed production of modern can manufacturing, and for obtaining the desired rigidity in the finished container.

Further research and development by both U.S. Steel and can manufacturers is expected to determine when the new product will become fully available.

Supplier: United States Steel Corporation, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

7826 on Reader Service Slip.

that's interesting

Pickle picker-upper

Sugar, added after the pickling process, enhances pickle flavor by blending the bite of acid and the sharpness of the spices.

Researchers at Department of Food Science and Technology of University of California found that adding small amounts of sugar after processing counteracted the apparent overacidity of the sour control samples (five brands of commercially packed dill pickles) and enhanced the desirable spicing flavors.

Shades of Detroit!

Among startling changes predicted for the meat-packing industry in the years ahead — automatic and continuous boning and cutting operations, developed to the point where meat cuts will simply be stamped out like metal parts.

For more information on product at right, circle 7827 see information request blank opposite last page.

GAYLORD SETS THE STAGE
FOR SMOOTH AUTOMATIC PACKAGING

Plan a happy ending for your automatic packaging.
Buy containers that fit your machinery precisely,
flow through your lines without a stumble or a fluff.

Gaylord produces such containers, with
letter-perfect precision, in any number you need.
Get the whole story from your Gaylord Man.
He'll turn in an award-winning performance.

CROWN ZELLERBACH CORPORATION
GAYLORD CONTAINER DIVISION

IN CANADA · CROWN ZELLERBACH CANADA. LTD. VANCOUVER, B. C.

HEADQUARTERS. ST. LOUIS
PLANTS COAST TO COAST

Exact Weight's New Automatic Checkweigher

Latest electronic controls

New engineering features

New compact size

SELECTROL®

MODEL 1206 with horizontal (side by side) rejection for tall products such as cans, cereal cartons, etc.

This new Selectrol checkweigher automatically weighs, classifies and sorts at speeds up to 120 items per minute, depending on size and weight of object. Rejection accuracy is 2/10 percent of the weight of the commodity at maximum speed.

New Selectrol features include compact size that requires minimum space in a conveyor line . . . and simplified circuits. Electrical controls are mounted above the conveyor line for easy accessibility.

Selectrols are made by Exact Weight, a leading manufacturer of job-engineered scales for 45 years with experience gained through hundreds of checkweighing installations during the past 18 years. For complete details, write for Bulletin 3377.

THE EXACT WEIGHT SCALE CO.

909 W. FIFTH AVE., COLUMBUS 8, OHIO

In Canada: 5 Six Points Road, Toronto 18, Ont.

Sales and Service Coast to Coast

Find us in your local "Yellow Pages"

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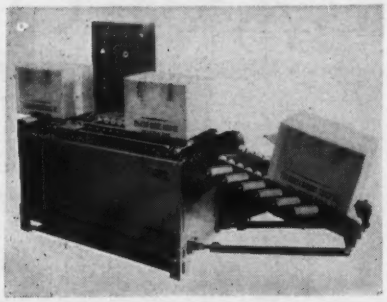
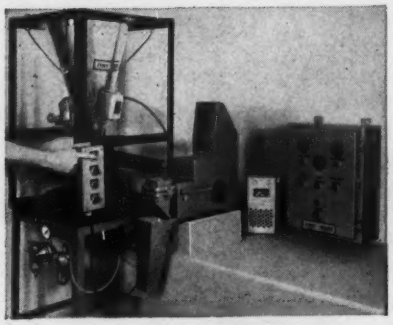
OTHER EXACT WEIGHT EQUIPMENT



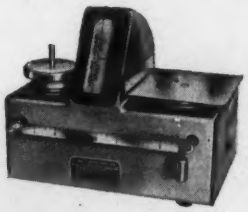
CASE AND BAG CHECKWEIGHER

Model 1250 Selectrol designed for checking bags, cartons and cases from 20 lbs. to 100 lbs. Speeds to 30 products per minute; rejection accuracy 1/10 of one percent at maximum speed. Can be supplied with or without rejection equipment. Write for Bulletin 3376.



PRECISION AUTOMATIC NET WEIGHING MACHINE

Model 4601NW for weighing dry, free-flowing products with accuracies of 1/10 gram on quantities below 10 grams and one percent accuracy on quantities of 10 grams and above. Models with capacities from 50 grams to 500 grams. Write for Bulletin 3363.



SHADOGRAPH® SCALES

Extremely fast with high degree of visible accuracy for use in all kinds of repetitive production weighing operations. Available in 35 models in capacities from 2000 milligrams to 100 lbs. Write for Bulletin 3333.

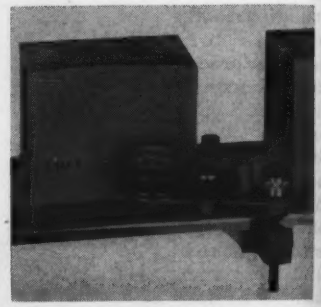
packaging

More than 100,000 sharp imprints without re-inking

Micro - porous plastic ink roller has 'built-in' reservoir

Uses: Friction-driven Model 1519 coder is easily attached to any type of conveyorized line, and may be used to code top, side or bottom of cartons.

Features: Use of Porelon®, a new micro-porous plastic material developed by S. C. Johnson & Sons, Inc., for ink



Compact coder attaches to virtually all conveyorized packaging, shipping or processing equipment by means of a single bracket

rollers provides a "built in" reservoir that permits coder to be used continuously for a week or more without re-inking.

Description: Extremely simple in construction, coder has two instead of the three rollers found on conventional printing and coding attachments. The printing roller is inked directly by the Porelon ink roller.

Because the ink is an integral part of the Porelon roller's construction, it is distributed in a uniform amount throughout the entire imprinting operation.

Coder's printing roller has a 10-in. circumference, easily interchangeable printing plates and can handle type up to two in. high.

Porelon rollers are available in a variety of colors.

Supplier: Bell-Mark Corporation, 18 Ropes Pl., Newark 7, New Jersey.

7829 on Reader Service Slip.

that's interesting

Spuds spurt

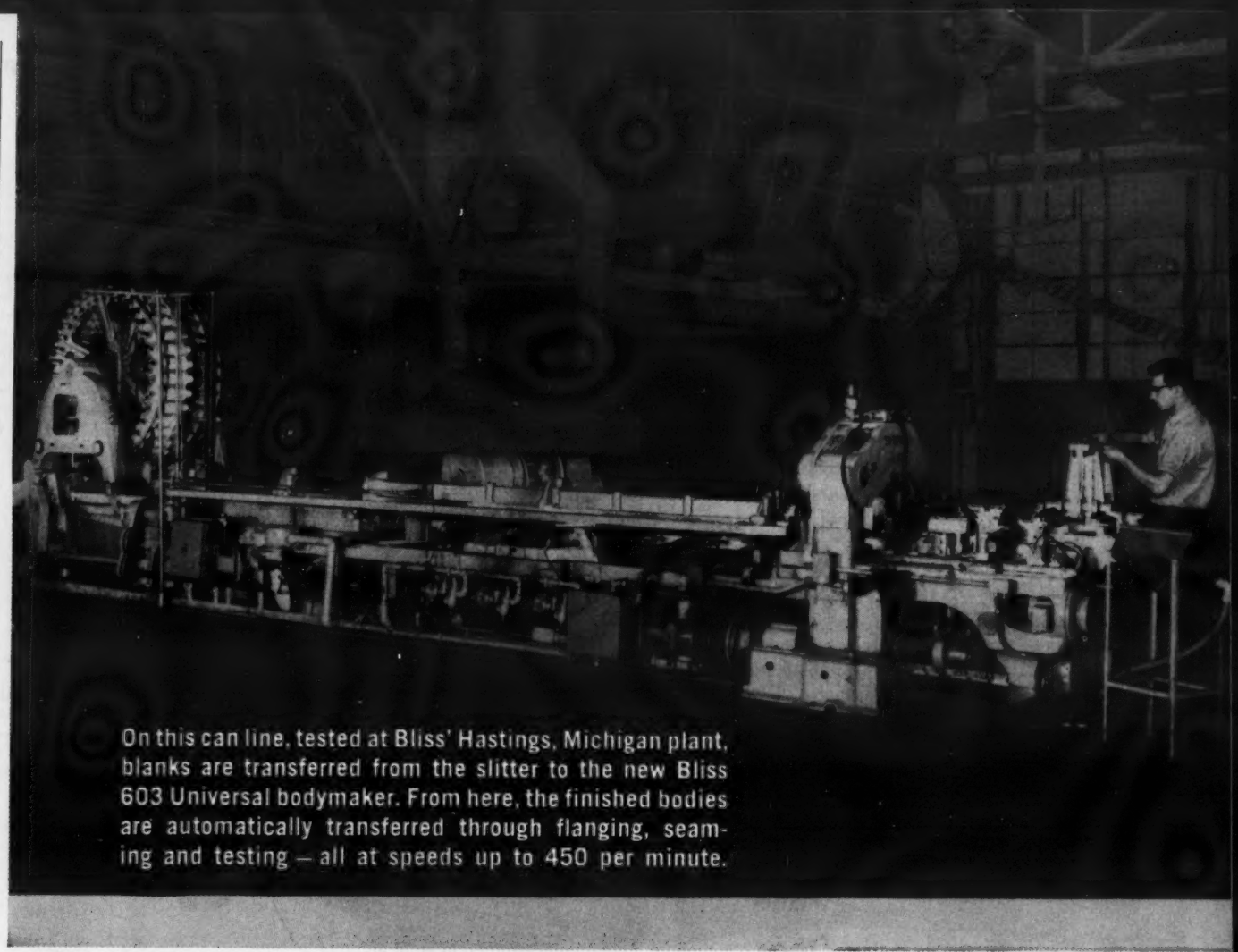
Quality and variety of product are keys to the 1400 per cent increase in frozen potato consumption since 1950, states Nephi Grigg, president of the Frozen Potato Institute.

As example of variety, he notes that his own company — Ore-Ida Frozen Potato Products, Inc. — packs seven totally different types of frozen potato products (verging from french-fries to hash-browns) yet is continually researching for additional varieties.

America's loving cup

Coffee now is the most popular food item in US homes, according to national menu study by the Market Research Corp. of America, sponsored by representative food manufacturers. Served an average of 13 times per week, it is used at some time or other in the home by 97 per cent of US families.

Most stimulating statistic has to do with instant coffee, which last year culminated a 15-year growth by accounting for one-third of all US coffee sales.



On this can line, tested at Bliss' Hastings, Michigan plant, blanks are transferred from the slitter to the new Bliss 603 Universal bodymaker. From here, the finished bodies are automatically transferred through flanging, seaming and testing — all at speeds up to 450 per minute.

BLISS MAKES 2 MILLION CANS IN NOVEL TEST OF CAN LINE

For a few weeks last fall, E. W. Bliss Company was in the can-making business. When Bliss finished building the first of six complete can lines, they thoroughly tested the line by producing 2,000,000 cans in their own plant at Hastings, Mich.

Almost completely automatic in operation, the line produced the finished, tested cans at speeds up to 450 per minute.

Key unit is the new Bliss 603 Universal Bodymaker, shown above. The 603 makes a wider assortment of can sizes than any other bodymaker; can turn out bodies as large as 6-3/16" diameter and 5-9/16" high. The substitution of standard change parts enables it to make bodies 7-13/16" high! This remarkable versatility makes the 603 ideal for packers who use many different can sizes.

It will pay you to take a look at the new 603 and other equipment in the Bliss high-speed can line. To get complete information on these products, ***"just drop us a letter — we'll send our latest bulletins."***

BLISS SINCE 1832

E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name—it's a guarantee

PRESSES • ROLLING MILLS • ROLLS • DIE SETS • CONTAINER MACHINERY • CONTRACT MFG.

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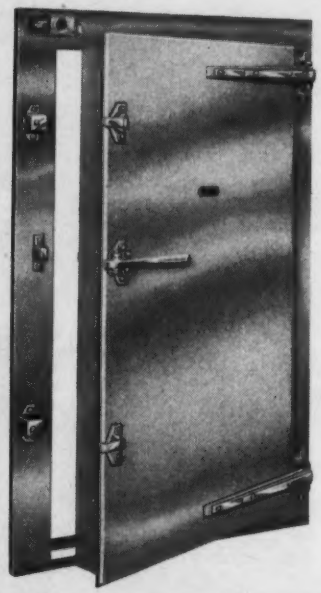
Plan now for improved plant operation with Jamison Doors

plan for frozen meat operations



Jamison Freezer Door

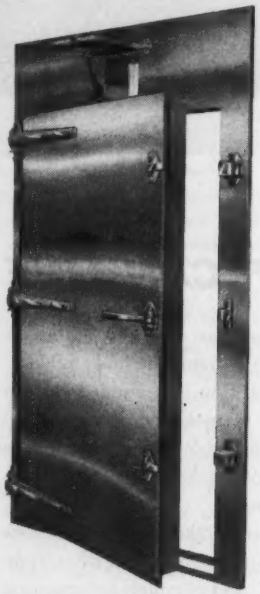
Lo-Temp Vap-r-tyt® Freezer Door with proven features for outstanding performance and economy.

plan for better smokehouse operation

Jamison Smokehouse Door

All-metal smokehouse door with fiberglass high temperature insulation and special gasketing.

plan for efficient track rail handling



Jamison Track Door

Series "50" Track Door for use where material must be moved and stored on overhead track rails.

plan for power truck operation

Jamison Electroglide® Door

Smooth, automatic power-operated doors speed high volume trucking, save refrigeration.

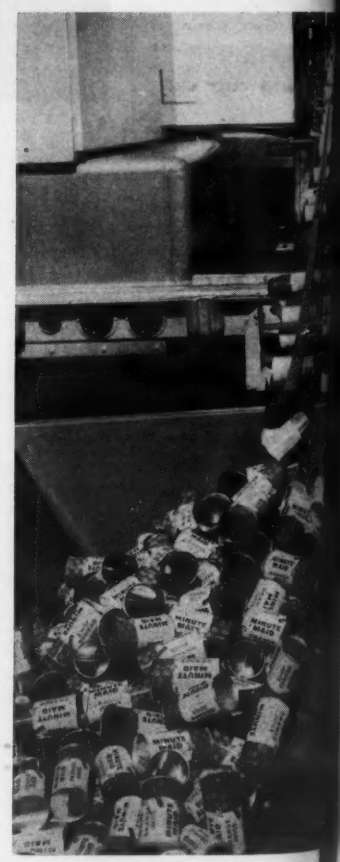
For catalog data on all the above doors write today to Jamison Cold Storage Door Co., Hagerstown, Md.

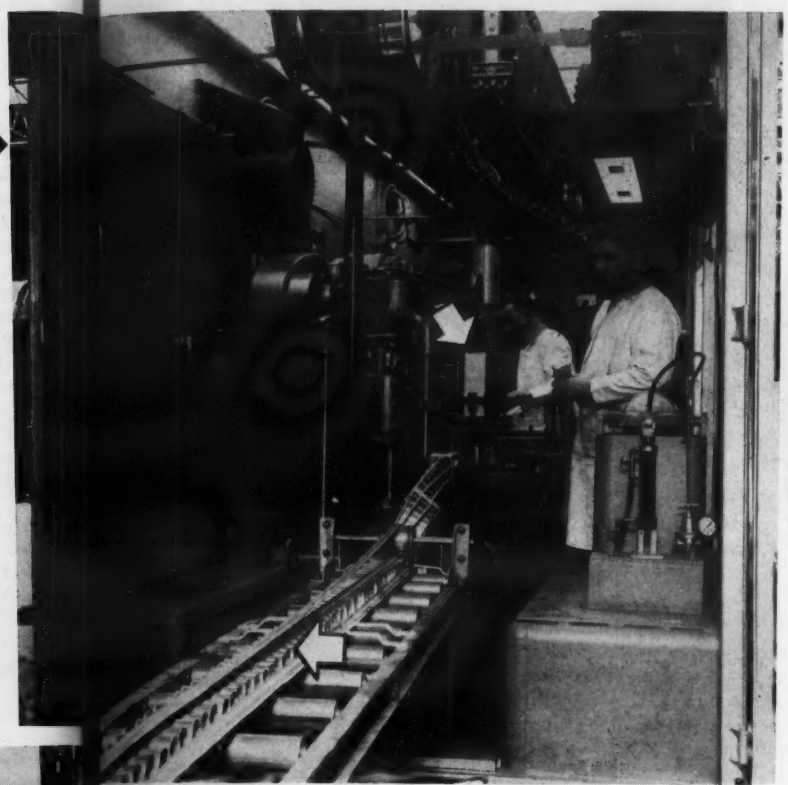
JAMISON
COLD STORAGE DOORS

7831 on Reader Service Slip.

Inside can-making trailer, operator in foreground prepares to insert load of can ends (bottoms) into can-maker's magazine. Man in background has inserted a load of aluminum body blanks, shown stacked up directly in front of him (upper arrow). Cans in foreground (lower arrow) are being conveyed out open end of trailer

Leaving can-making trailer, the printed, formed cans, with bottoms applied, feed into a bin on loading dock. Bin's conveyor-belt bottom carries cans to concentrate-filling lines





At Minute Maid plant . . .

Make aluminum cans from pre-cut blanks

Major experiment prelude to integrated can-making-and-filling production line

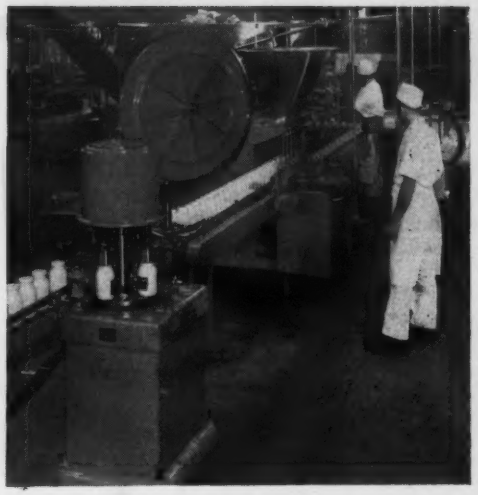
NORB LEINEN
Associate Editor

The first on-premises production run of cans in the history of the frozen concentrate industry — whereby six-oz aluminum cans were assembled and packed in one continuous operation — recently took place at the Auburndale, Fla., plant of Minute Maid Corp.

Involving a 6,500,000-can pack, the revolutionary experiment followed several years of test-packaging of frozen orange concentrate in aluminum cans by Minute Maid, and was observed by fruit packers throughout the citrus belt. The experimental cans are reported to reduce shipping costs by approximately $1 per thousand cans.

The can parts — consisting of printed, flat, coated aluminum can bodies, with separate tops and bottoms — were cut at the Sheffield, Ala., plant of Reynolds Metals Company and supplied to Minute Maid along with can-

IT PAYS
TO
CAP'EM
with
CAPEM



Model C-4F CAPEM in action on the new mayonnaise and salad dressing line at Pfeiffer Food Products, Buffalo, N. Y.

This CAPEM machine is applying 70mm caps to 7200 jars an hour. A new Consolidated feature is a special chuck-arresting device which prevents the chuck from descending if no caps are available.

CAPEM Screw Capper speeds range from 2,000 to 20,000 containers an hour for any standard cap or cover and many special types. They combine low initial cost, with low operating and maintenance cost.

CAPEM delivers a perfect *leakproof* seal whether you're processing bottles, cans or jugs of any shape or size. Our customers agree—and you will too—*it pays* to cap 'em with CAPEM!

Write Sales Manager, Consolidated Packaging Machinery Corp.,
(a Subsidiary of International Paper Company)
1400 West Avenue, Buffalo 13, New York

—CAPEM→ THE MODERN SCREW CAPPER

7832 on Reader Service Slip.

you don't have to increase pump speed

...to get GREATER PUMP VOLUME

in fact ... the revolutionary Royal Crown Pump Valve increases pump volume with less pump speed! Here's how it operates: Valve is guided by a frictionless ball stem (not a rigid guide) which allows it to oscillate and turn freely with the fluid stream with a minimum of resistance. The result: greater pump volume at a slower pump speed for maximum pump efficiency and economy. Royal Crown Valves have only three separate parts which assures long, trouble-free service. Adaptable to all reciprocating pumps and all liquids.

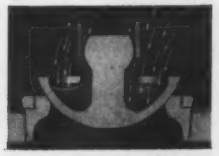
Royal Crown
PUMP VALVES

WRITE FOR FREE LITERATURE TODAY

Round valve surface is streamlined. No crossbars or obstructions in seat to restrict the flow of liquid.

Ball-guided valve rotates and swings with each stroke of the pump. Each turn, each swing a lapping action—a perfect seat.

Free vertical action assures instant opening and closing. Ball stem is a frictionless guide.



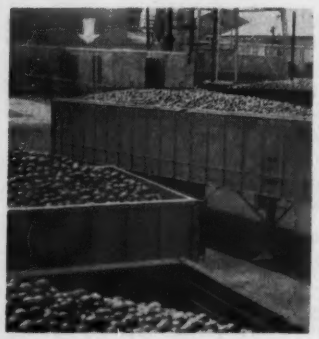
MADSEN WORKS / BALDWIN-LIMA-HAMILTON Construction Equipment Division
14120 E. ROSECRANS AVE., P.O. BOX 38, LA MIRADA, CALIFORNIA
BALDWIN-LIMA-HAMILTON CORPORATION, LIMA, OHIO

7833 on Reader Service Slip.

making machinery in a trailer sent from Reynolds' headquarters in Richmond, Va.

Hooked up with Minute Maid's packing lines, the trailer established a single production line which formed can bodies and sealed them with cement, applied can bottoms, filled cans with orange concentrate, closed them, froze the juice and placed cans in cases for shipping.

Trailer-borne can-making machine used was a standard body maker manufactured by



View of yard at Minute Maid plant shows trailer sent by Reynolds in background (arrow)

Baldwin-Lima-Hamilton Corp,. 940 Simpson St., Philadelphia 42, Pa.

Only significant modification to unit by Reynolds' engineers was to substitute a vacuum pick-up for use with non-magnetic aluminum in place of the conventional magnetic pick-up used with tinplate. In addition, minor spring adjustments were made to conform to aluminum's lighter weight.

Can closing (in the Minute Maid plant) was by means of a standard double-seamer manufactured by Angelus Sanitary Can Machine Company, 4900 Pacific Blvd. & Lowell St., Los Angeles 58, California.

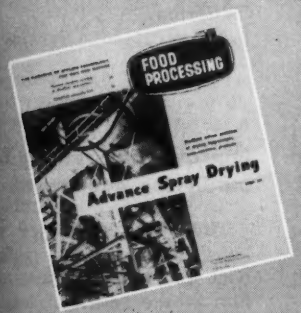
Now back at the Reynolds' facility in Bellwood, Va. (near Richmond), the can-making trailer is being used for technological experiments with uncoated aluminum — which it is believed may prove compatible with citrus concentrate. Experimental results may be available early in 1961.

Yes, that's right; the PUTMAN PUBLISHING COMPANY publishes 2 distinctly different magazines to serve one field—each serving a distinctly different area of the fabulous food industries

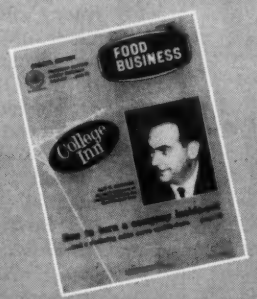
As a reader of FOOD PROCESSING, you may be interested in knowing something about its companion magazine, FOOD BUSINESS, that serves your company's marketing and sales management, advertising and merchandising executives.

- Editorially, FOOD BUSINESS is devoted exclusively to the business or marketing "side" of the food industries . . . new product introduction, package design, distribution, advertising, promotion and all the steps necessary to successfully sell your products.
- In its particular area, FOOD BUSINESS is a recognized editorial leader. It goes beyond current news to delve into the significance of trends which can be applied to the selling of your company's products.
- FOOD BUSINESS literally picks up your product from the production line and delivers it at the point of sale . . . the grocery shelf.
- FOOD BUSINESS gives its advertisers the greatest coverage of key food marketing executives . . . virtually blankets the food industries with 25,000 circulation.
- FOOD BUSINESS gives greatest readership, top performance . . . measured by ***READER ACTION***
- FOOD BUSINESS is the fastest growing advertising medium that serves food industry marketing executives, because advertisers recognize the importance of its contribution to complex problems of selling food today.

Together, FOOD PROCESSING and FOOD BUSINESS represent "total service" to your business...the food processing industry, America's Number 1 Industry.



to help you make better products



to help your associates sell more products

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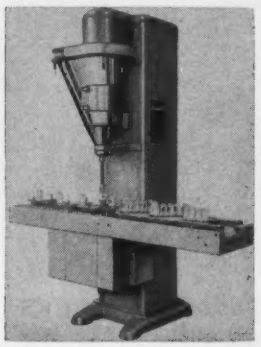
NPP BPA

Combines semi-automatic accuracy and versatility with increased speed

Uses: New FMC Automatic Universal Filler steps up production and reduces unit costs for wide range of dry products and almost any rigid container.

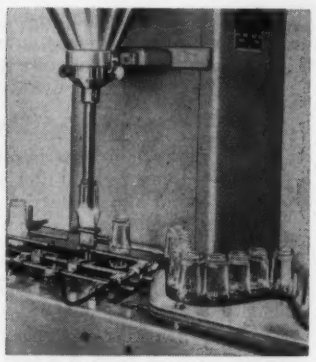
Features: Great versatility and quick changeover make



Filler fits into existing conveyor systems, or containers may be hand-fed to its conveyor section

the Model EG-6 ideal for both long and short runs at speeds to 50 containers per min.

Three different filling methods — adjustable cam volumetric, volumetric packing

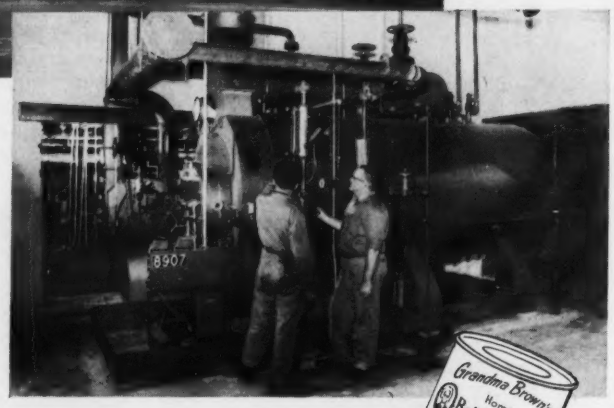


Special serpentine conveyor feed provides in-motion stability for unusual container shapes — such as oval cans or the tapered jars shown above

and vacuum volumetric — are offered for filling cans, jars, cartons, bottles, boxes.

Interchangeable augers, simplified controls, readily accessible mechanical adjustments and variable-speed conveyor belts reduce changeover time

Although Grandma Brown began operations in 1937 on a kitchen stove, BWB Foods, Inc., now operates this modern plant at Mexico, N. Y.



BWB Foods maintenance man checking 150 hp Cyclotherm. Cyclotherm's automatic operation eliminates engineer-operators, cuts maintenance costs by up to 50%.

BWB FOODS, INC.,

gets the

CYCLOTHERM *Boiler Habit*

BWB Foods, Inc., producers of Grandma Brown's Baked Beans got its first Cyclotherm boiler (60 hp) in 1947. In 1947, along came Cyclotherm No. 2 (80 hp). Last year, BWB more than doubled its Cyclotherm capacity with a 150 hp unit. That's repeat sales!

Modulation Important

BWB particularly appreciates Cyclotherm's modulation control. This feature permits the equipment to operate at from 30% to 100% of capacity without loss of efficiency. And the modulation control on the Cyclotherms aids in quality control of the beans.

Under One Roof

Cyclotherm boilers are built under one roof, with one manufacturing responsibility behind the entire equipment. They are fire-tested by Cyclotherm and shipped ready to operate. Because of their advanced design, Cyclotherms are up to ⅓ smaller than other package boilers of equal capacity—can be accommodated in limited boiler-room space.

Complete Line

Cyclotherm produces a complete line of steam boilers, with 18 models ranging from 15 to 750 HP. Cyclotherm hot water boilers, 10 models, are rated at from 670,000 to 6,700,000 BTU. Cyclotherms meet all state requirements, conform to A. S. M. E. and National Board Standards, carry Underwriters' Laboratories label.

YEARS AHEAD IN STEAM & HOT WATER GENERATION

CYCLOTHERM®

STEAM AND HOT WATER GENERATORS

Division of Crane Co.
61 E. First St., Oswego, N. Y.

Clip to your letterhead:

Please send me full information on Cyclotherm Steam and Hot Water Boilers.

61

7834 on Reader Service Slip.

to a minimum.

Description: Unit handles containers ranging in size from 1 in. by 1 in. by 1½ in. to 4½ in. by 4½ in. by 8 in.

As container reaches filling position, it is raised to filling head by a small platform atop a compressed-air-activated cylinder. When filled, container is automatically lowered and carried off by continuously operating conveyor belt.

Micro-switch system permits containers to be moved to and from filling position quickly and positively.

Supplier: Food Machinery and Chemical Corp., FMC Packaging Machinery Div., 4900 Summerdale Ave., Philadelphia 24, Pa.

7835 on Reader Service Slip.

Versatile automatic filler handles any liquid product with . . .

Minute-quick changeover

— of product-contact parts
— of container sizes

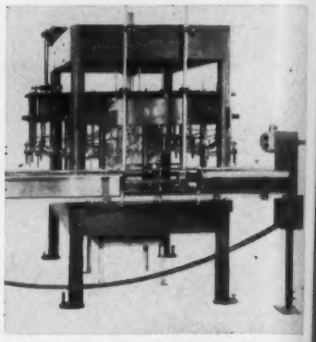
Uses: Automatic 30/60 liquid rotary filler provides great single-unit versatility for processors who package a variety of liquid food products, or, alternately, food and non-food products.

Features: Because product-contact parts can be changed completely in minutes, filler can be used to handle, successively, various liquid products, without possibility of cross-contamination.

Versatility extends to a provision for doubling unit's output. Bought as a 30-head filler, it will go as fast (over 300 bottles per min) as any other equipment with which it works — such as cappers, casers, and labelers.

When these packaging-line machines progress to higher speeds, the 30-head filler already is completely machined and ready to receive 30 additional tubes — doubling its speed to over 600 BPM.

Description: Costs are reduced by elimination of expensive worms and timing stars. By using a replaceable roller chain attached to the perimeter of an overhead circular plate instead of the usual cast-tooth bull gear, more precision and less backlash are achieved, at lower cost.



Same 30/60 unit fills bottles as small as two oz (by vacuum), cans as large as two gal (by pressure)

Maintenance is easy, since all drives are overhead and parts out in the open. Moreover, breakage and clean-up cannot cause corrosion of drives.

Supplier: 30/60 automatic liquid rotary filler by Laub Engineering Co., 244 N. San Marino Ave., San Gabriel, California.

7836 on Reader Service Slip.

Improve heat sealing by modifying equipment

Three of the major problems in obtaining effective heat seals with polyethylene film — the result of improper design or use of heat-sealing equipment — are subject of new two-pg technical data sheet, "Improve Heat Sealing by Modifying Equipment," offered by U.S. Industrial Chemicals Co., Div. of National Distillers and Chemical Corp.

Informative table also considers the most likely possible causes of the respective difficulties and suggests corrective action in each case.

7837 on Reader Service Slip

technical literature Classified Listing

- **Equipment**
- **Ingredients**
- **Supplies**

Starred* items below have been more extensively reviewed elsewhere in the magazine. Items followed by (†) indicate literature offered by advertisers. Key numbers in the last line will help locate these reviews, which are numbered in sequence.

Processing Equipment, Accessories

Permanent non-electric magnetic pulleys to remove tramp iron from flow†, 6 pp, (Bul with installation photos, selector guide, etc.) Eriez Mfg. Co.
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Fully automatic no-frost refrigeration rooms†, (Bul No. 105) Niagra Blower Co.
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Homogenizers and dispersers reduce ingredients down to their ultimate particle size, disperse them evenly†, (3 Buls: H-55 on Homogenizers; SMD-55 on Sub-Micron Dispersers; and C-57 on Colloid Mills) Manton Gaulin
7843 on Reader Service Slip.

Centrifugal extractors for complex operations*, 8 pp, (Bul 2567) Centrico, Inc.
7788 on Reader Service Slip.

Complete line of drying equipment and systems described and illustrated*, 16 pp, (Bul No. 448) Proctor & Schwartz
7769 on Reader Service Slip.

Packaged generators for in-plant CO_2 manufacturing*, 6 pp, (Bul CD-260) Louis DeMarkus Corp.
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Panelcoils replace pipe coils for heating, cooling*, 2 pp, (Bul M-8) Dean Products, Inc.
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Equipment for mixing and blending in shipping drums*, 12 pp, (Bul DM-290), U.S. Stoneware Co.
7776 on Reader Service Slip.

Case history on grinding with roller mills†, (2 Bus: Details of Case History in Pointers, Vol. 2 No. 5; Specifications on roller mill, Bul 153-A) Sprout-Waldron
7844 on Reader Service Slip.

Highly intimate blends in 1 to 2 minutes†, (Bul No. 080B) Sturtevant Mill Co.
7845 on Reader Service Slip.

Ingredients, Food Additives

Gums of all types specially processed for the food industry†, (Descriptive Technical Bulletin) Meer Corporation
7846 on Reader Service Slip.

Fixative retains vanilla odor, taste and flavor strength in baked products†, (Samples and Literature) Givaudan Flavors
7847 on Reader Service Slip.

Packaging, Labeling, Cartoning

Problems and corrective measures in heat sealing polyethylene*, 2 pp, U.S. Industrial Chemicals Co.
7837 on Reader Service Slip.

Controlled packaging fillers and weighers†, (Cat No. 55) Weigh Right Automatic Scale Company
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Makes cans right in your plant at speeds up to 450 per minute†, (Bulletin) E. W. Bliss Company
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Bulk Handling, Accessories

Complete line of storage and transport equipment†, (Lit.) Walker Stainless Equipment Co.
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Permaglas bulk storage system†, (Bul MU-107) A. O. Smith, Harvestore Products Div.
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Metal process belts in continuous food processing†, (Illustrated Literature) Ashworth Brothers, Incorporated.
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Metal-mesh conveyor belts†, 130-page reference manual, The Cambridge Wire Cloth Co.
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Transfer measured amounts of different fluids direct from original containers†, (Free Idea Booklet) Gray Company, Inc.
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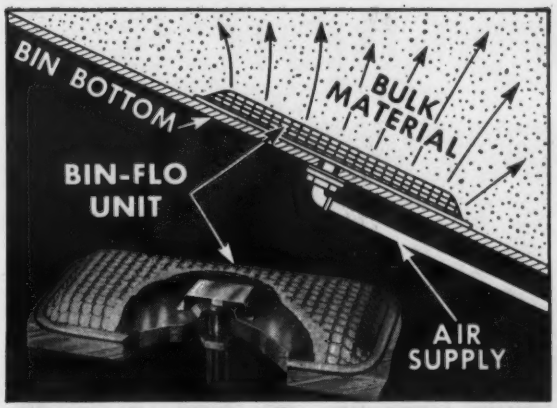

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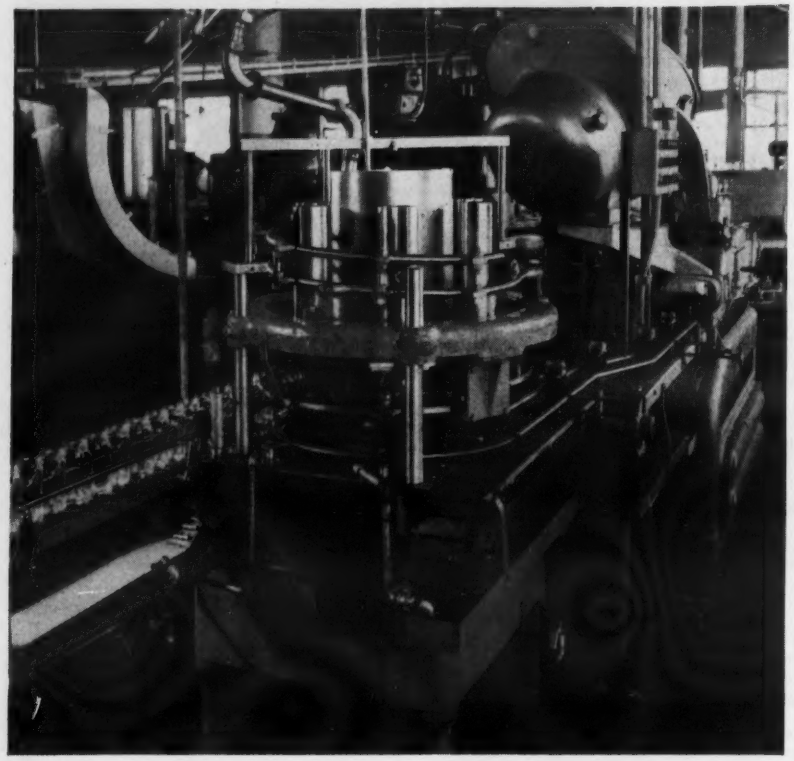

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artificially sweetened fruit jellies and fruit preserves or jams will be considered.

In the second phase, objections to the order amending the fruit jellies standard to permit artificial red coloring in cinnamon-flavored apple and/or crabapple jelly will be considered.

FDA has concluded that the objections filed on the issues listed below state reasonable grounds for a hearing.

A. With respect to the order establishing standards for artificially sweetened fruit jellies and artificially sweetened fruit preserves or jams, there was question as to:

1. Whether the establishment of standards of identity for these foods under the names specified would promote honesty and fair dealing in the interest of consumers.

2. Whether the standards of identity should provide for limits on fruit content other than those specified in the proposal.

3. Whether the list of jelling ingredients provided in each standard should be expanded to include certain additional jelling ingredients.

4. Whether the standards should permit artificial coloring, propylene glycol and sugar as optional ingredients.

B. With respect to the amendment permitting use of artificial red coloring in cinnamon-flavored apple and/or crabapple jelly, there was question as to:

1. Whether use of artificial red coloring would permit use of low-quality fruit in the foods specified.

2. Whether use of artificial red color in the foods specified would result in the substitution of these cinnamon-flavored, artificially colored jellies by institutional users for the more expensive berry jellies.

3. Whether the amendment would promote honesty and fair dealing in the interest of consumers.

Cheddar, Washed Curd, Colby, Granular and Swiss Cheeses: A hearing, tentatively scheduled for August, will be held to consider an amendment to provide for optional use of limited amounts of hydrogen peroxide and catalase for treating milk used to make these cheeses (see FOOD PROCESSING, June).

Orange Juice: A public hearing will be held and the standards will not become effective on June 1.

Numerous objections were filed with FDA: that standards are unnecessary because of already existing quality and inspections; that by prohibiting sodium benzoate in the standard, FDA was discriminating against the packers; that "industrial orange juice" should be included in the proposed standards; that the effective date would result in losses from products already formulated.

Regarding the probable date of final resolution of this matter, FDA issued the following statement:

"Important issues are involved which can be resolved only after consideration of what is likely to be rather extensive evidence. It is therefore apparent that no standards based on the testimony at a hearing could be made effective before the spring of 1961. From the nature of some of the objections, it is anticipated that the effective date of the order which will issue following the hearing will have to be determined on the basis of testimony at that hearing."

Enriched Rice: Objections will be considered on a feature of this standard which includes use of riboflavin as a nutrient. Some millers object to the fact that riboflavin changes the color of rice from white to pale cream.

Cream Cheese and Neufchatel: A proposal has been made to specify propylene glycol alginate as an additional optional ingredient to hold water in the cheeses. At the same time, the petitioner, Kelco Company of San Diego, California has filed a petition for clearance of the substance under the Food Additives Amendment.

A decision on both the food additive petition and the standards amendment will be made simultaneously. END

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7714	7746	7778	7810	7842	7874
7715	7747	7779	7811	7843	7875
7716	7748*	7780	7812	7844	7876
7717	7749	7781	7813	7845	7877
7718	7750	7782	7814	7846	7879
7719	7751	7783	7815	7847	Back
7720	7752	7784*	7816	7848	Cover
7721	7753	7785	7817	7849	7878
7722	7754*	7786	7818	7850	
7723	7755	7787	7819	7851	

*Since there are several items covered by this number, please list this number with the specific item on which you want additional information in the "Multiple Listings" column at right.

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* "substantial operations" does not necessarily mean an extremely large plant. But requests for the magazine exceed supply so we must set standards to insure publication being sent where it can be used to best advantage.

that's interesting

Maybe it's just 'green thumb'

"What makes your vegetables so green?" is question frequently asked of US personnel at foreign trade fairs where American frozen foods are on exhibit. Many viewers can't believe that a processed vegetable could have that color naturally, and suspect that we dye our peas.

Let the canners teach, and teach they can

The public's lack of understanding of the economics of food and the food industry's role in getting food on the nation's tables should be countered by food industry people personally, according to Norman Sorensen, 1959 president of the National Canners Assn.

Individual canners, he pointed out, could effectively disseminate facts about the canning industry's operations at the grassroots level by talking to employes, service clubs, churches, schools, newspapers and radio-tv stations.

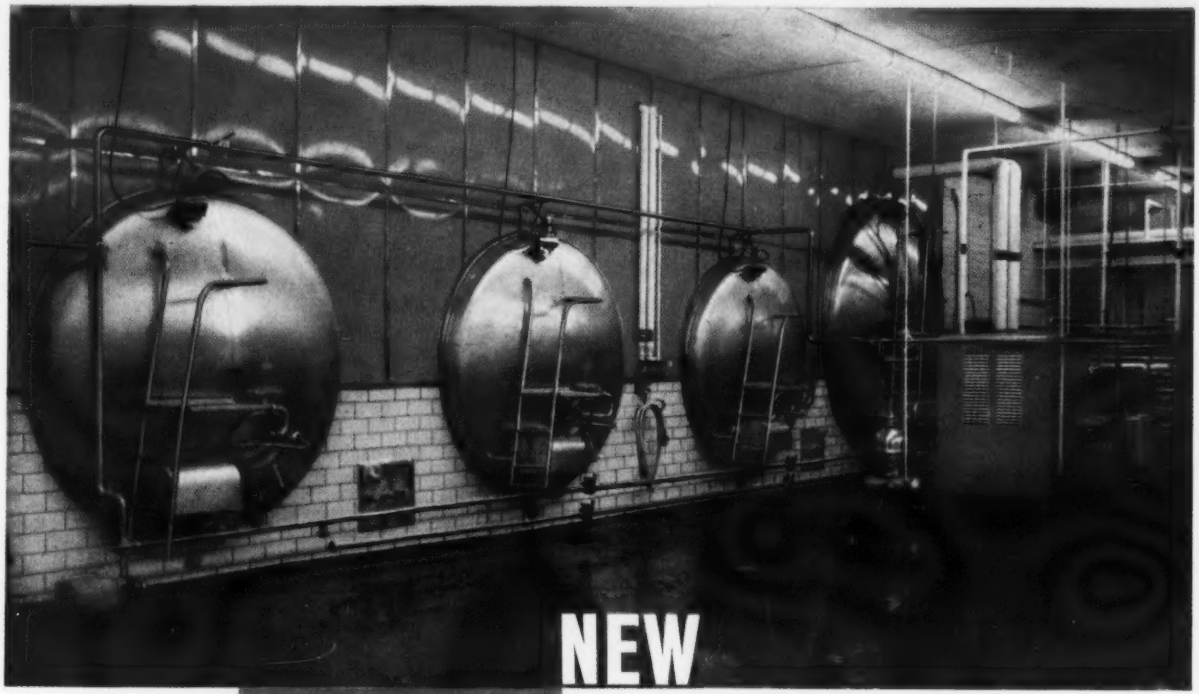
Mulch ado about polyethylene

Preliminary testing at Union Carbide Company's 250-acre experimental farm in North Carolina suggests that polyethylene film, acting as a mulch, can speed the growth of trees.

As example, a Golden Delicious dwarf apple tree gained 120 per cent in trunk diam over an unmulched Golden Delicious. A Yellow Transparent made a 95 per cent gain.

Factors responsible may be: 1) black polyethylene film preserves soil moisture and prevents weed growth which robs trees of water and soil nutrients; 2) it moderates summer and winter soil temperatures; 3) it reduces fertilizer leaching from irrigation and rainfall. (PLASTICS WORLD, April 1960)

ANOTHER FOOD PROCESSOR PROTECTS QUALITY AND PROFITS WITH *Creamery Package*® EQUIPMENT



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